

EXHIBIT 10

Comparison of the Results of the Three Different Measurement Techniques

JIS-C Hardness at a Point Approximately 5 mm from the Core Surface

	Average Measured Hardness Difference			Percentage of Tested Balls that Fell Inside Claimed Range ²		
	Method 1	Method 2	Method 3	Method 1	Method 2	Method 3
Golf Ball Tested	Bridgestone Fall 2006 ¹	Bridgestone January 2007	Acushnet February 2007	Bridgestone Fall 2006	Bridgestone January 2007	Acushnet February 2007
NXT	11.4 / 10.6	5.4	8.9	3% / 0%	100%	8%
DT So/Lo	11.4 / 11.1	5.5	8.5	15% / 13%	100%	8%
Exception	10.7 / 10.6	4.6	9.2	25% / 25%	100%	0%

¹ In the fall of 2006, Bridgestone reported the hardness twice on each ball, on Side A and on Side B.

² For comparative purposes only, this chart liberally includes balls whose hardness difference is exactly 8 degrees as falling inside the claimed range. This is to avoid any legal dispute on the claim meaning. If balls with a hardness difference of exactly 8 are not counted as falling within the limitation, which reads "up to 8 degrees lower," then even fewer, and in several cases zero, balls would be counted as falling inside the claim range.

EXHIBIT 11

**THIS EXHIBIT HAS BEEN
REDACTED IN ITS ENTIRETY**

EXHIBIT 12



US005782707A

United States Patent [19]

Yamagishi et al.

[11] **Patent Number:** **5,782,707**[45] **Date of Patent:** **Jul. 21, 1998**[54] **THREE-PIECE SOLID GOLF BALL**[75] **Inventors:** **Hisashi Yamagishi; Hiroshi Higuchi,**
both of Chichibu, Japan[73] **Assignee:** **Bridgestone Sports Co., Ltd., Tokyo,**
Japan[21] **Appl. No.:** **812,925**[22] **Filed:** **Mar. 10, 1997**[30] **Foreign Application Priority Data**

Mar. 11, 1996 [JP] Japan 8-082121

[51] **Int. CL⁶** **A63B 37/06; A63B 37/12;**
A63B 37/14[52] **U.S. Cl.** **473/374; 473/373**[58] **Field of Search** **473/373, 374,**
473/378, 384[56] **References Cited****U.S. PATENT DOCUMENTS**

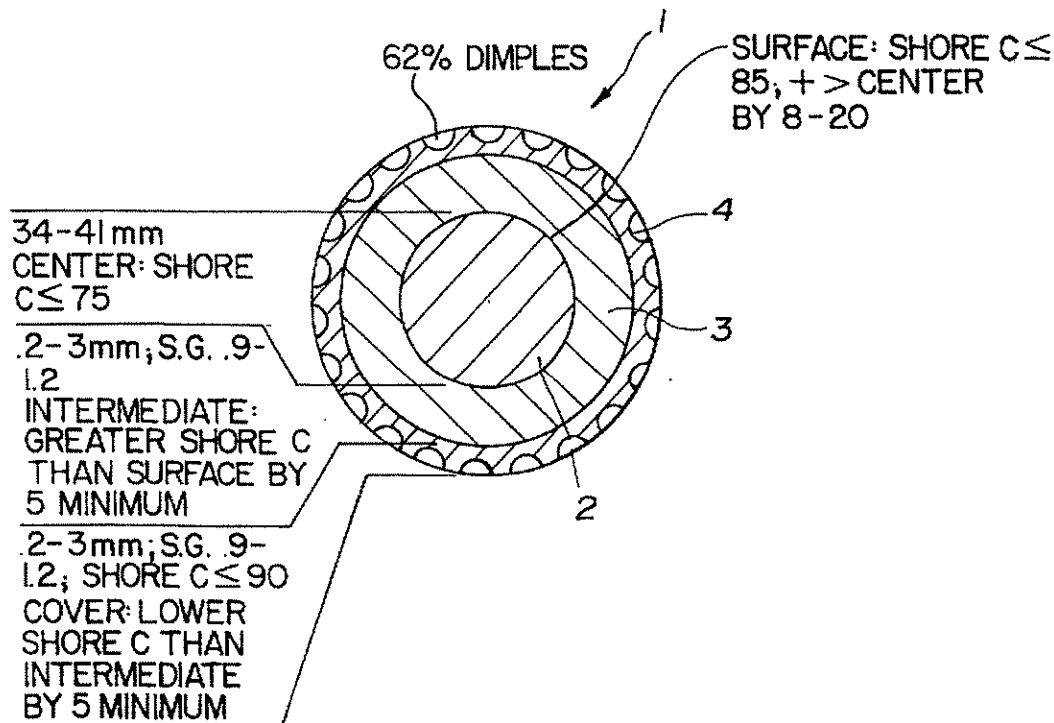
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 & Seas, PLLC

[57] **ABSTRACT**

The invention provides a three-piece solid golf ball featuring an increased flight distance on driver shots and improved control on approach shots. In a three-piece solid golf ball consisting of a solid core, an intermediate layer, and a cover, provided that hardness is measured by a JIS-C scale hardness meter, the core center hardness is up to 75 degrees, the core surface hardness is up to 85 degrees, the core surface hardness is higher than the core center hardness by 8 to 20 degrees, the intermediate layer hardness is higher than the core surface hardness by at least 5 degrees, and the cover hardness is lower than the intermediate layer hardness by at least 5 degrees.

6 Claims, 2 Drawing Sheets

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FIG.1

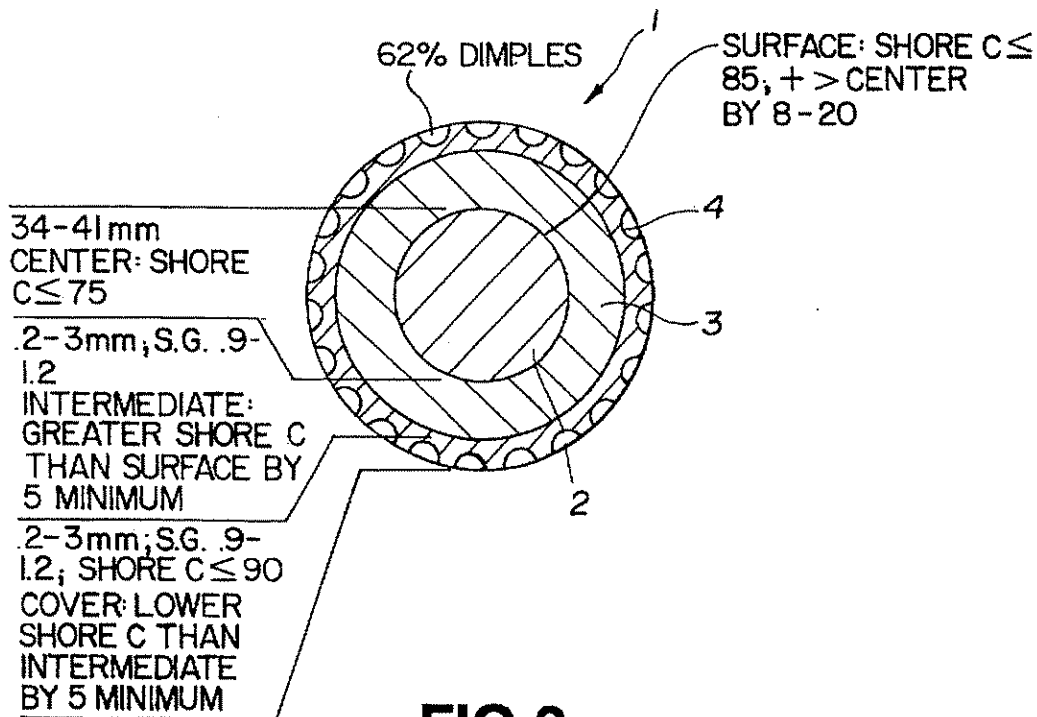
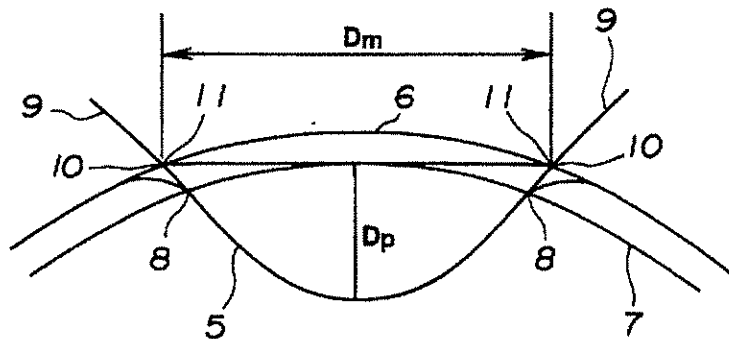


FIG.2



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FIG.3

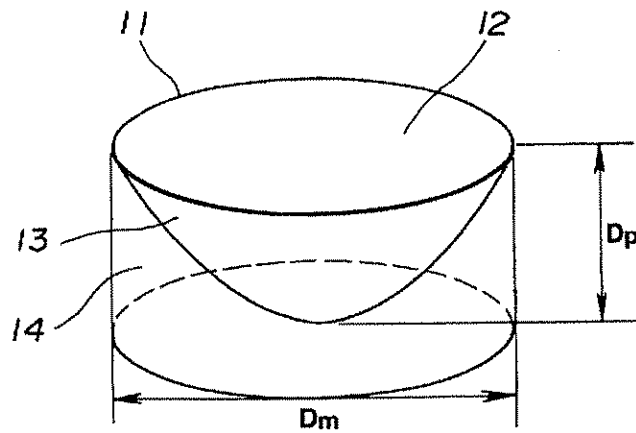
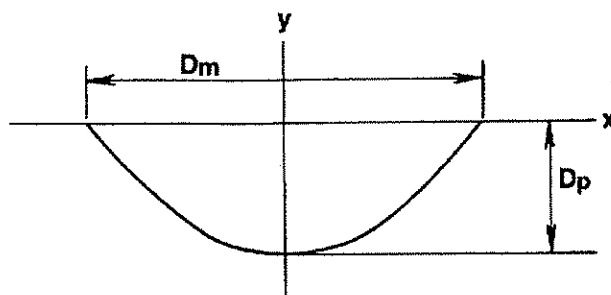


FIG.4



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THREE-PIECE SOLID GOLF BALL**BACKGROUND OF THE INVENTION****1. Field of the Invention**

This invention relates to a three-piece solid golf ball of the three-layer structure comprising a solid core, an intermediate layer, and a cover and more particularly, to such a three-piece solid golf ball which features an increased flight distance on full shots with a driver and improved control on approach shots with No. 5 iron or sand wedge.

2. Prior Art

From the past, two-piece solid golf balls consisting of a solid core and a cover are used by many golfers because of their flight distance and durability features. In general, two-piece solid golf balls give hard hitting feel as compared with wound golf balls, and are inferior in feel and control due to quick separation from the club head. For this reason, many professional golfers and skilled amateur golfers who prefer feel and control use wound golf balls rather than two-piece solid golf balls. The wound golf balls are, however, inferior in carry and durability to the solid golf balls.

More particularly, when two-piece solid golf balls are subject to full shots with a club having a relatively large loft angle, the ball flight is mainly governed by the club loft rather than the ball itself so that spin acts on most balls to prevent the balls from too much rolling. However, on approach shots over a short distance of 30 to 50 yards, rolling or control substantially differs among balls. The major cause of this difference is not related to the basic structure of the ball, but to the cover material. Then some two-piece solid golf balls use a cover of a relatively soft material in order to improve control on approach shots, but at the sacrifice of flight distance.

Controllability is also needed on full shots with a driver. If a soft cover is used as a result of considering too much the purpose of improving spin properties upon control shots such as approach shots with No. 5 iron and sand wedge, hitting the ball with a driver, which falls within an increased deformation region, will impart too much spin so that the ball may fly too high, resulting in a rather reduced flight distance. On the other hand, if the spin rate is too low, there arises a problem that the ball on the descending course will prematurely drop, adversely affecting the ultimate flight distance too. As a consequence, an appropriate spin rate is still necessary upon driver shots.

Anyway, the prior art two-piece solid golf balls fail to fully meet the contradictory demands of players, the satisfactory flight performance that the ball acquires an adequate spin rate upon full shots with a driver and the ease of control that the ball acquires a high spin rate upon approach shots with No. 5 iron and sand wedge.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a three-piece solid golf ball which features an increased flight distance on full shots with a driver and improved control on approach shots with No. 5 iron or sand wedge.

Making extensive investigations on a three-piece solid golf ball of the three-layer structure comprising a solid core, an intermediate layer, and a cover, we have found that the above object is attained by optimizing the hardness distribution of the core, forming a hard intermediate layer between the core and the soft cover, and adjusting a percent dimple surface occupation. By virtue of the synergistic effect

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of these factors, the resulting golf ball travels an increased flight distance on full shots with a driver and is well controllable on approach shots with No. 5 iron or sand wedge.

More specifically, we have found that the following advantages are obtained in a three-piece solid golf ball of the three-layer structure comprising a solid core, an intermediate layer, and a cover, when the solid core, intermediate layer, and cover each have a hardness as measured by a JIS-C scale hardness meter, the core center hardness is up to 75 degrees, the core surface hardness is up to 85 degrees, the core surface hardness is higher than the core center hardness by 8 to 20 degrees, the intermediate layer hardness is higher than the core surface hardness by at least 5 degrees, and the cover hardness is lower than the intermediate layer hardness by at least 5 degrees. Upon deformation in an increased deformation region (associated with full shots with a driver), the presence of a hard intermediate layer between a soft deformable cover and a soft core ensuring soft feel is effective for reducing the energy loss by excessive deformation of the core and thereby enabling to form a structure of efficient restitution while maintaining the softness of the ball as a whole. Then the ball will travel an increased flight distance upon full shots with a driver. Although a soft cover is used, the ball gains an appropriate spin rate and is free of shortage of flight distance. At the same time, in a reduced deformation region (associated with approach shots), the ball gains an increased spin rate and is well controllable. Additionally, by adjusting dimples such that the percent surface occupation of dimples in the cover surface is at least 62% and an index (Dst) of overall dimple surface area is at least 4, and optimizing the dimple pattern, the flight properties (flight distance and flight-in-wind) of the golf ball are further enhanced. By virtue of the synergistic effect of these factors, the resulting golf ball covers an increased flight distance on full shots with a driver and is well controllable on approach shots with No. 5 iron or sand wedge, that is, satisfies the contradictory demands of players.

Therefore, according to the present invention, there is provided a three-piece solid golf ball of the three-layer structure comprising a solid core, an intermediate layer, and a cover, having a plurality of dimples in the ball surface. Provided that the solid core at its surface and center, the intermediate layer, and the cover each have a hardness as measured by a JIS-C scale hardness meter, the core center hardness is up to 75 degrees, the core surface hardness is up to 85 degrees, the core surface hardness is higher than the core center hardness by 8 to 20 degrees, the intermediate layer hardness is higher than the core surface hardness by at least 5 degrees, and the cover hardness is lower than the intermediate layer hardness by at least 5 degrees. The dimples occupy at least 62% of the ball surface.

In one preferred embodiment, the dimples in the ball surface total in number to 360 to 450 and include at least two types of dimples having different diameters. An index (Dst) of overall dimple surface area given by the following expression (1) is at least 4,

$$Dst = \frac{n \sum_{k=1}^n [(Dmk^2 + Dpk^2) \times V_0 \times Nk]}{4R^2} \quad (1)$$

wherein R is a ball radius, n is the number of dimple types, Dmk is a diameter of dimples k, Dpk is a depth of dimples k, Nk is the number of dimples k wherein k=1, 2, 3, . . . n, and V₀ is the volume of the dimple space below a plane circumscribed by the dimple edge divided by the volume of a cylinder whose bottom is the plane and whose height is the maximum depth of the dimple from the bottom.

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BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic cross-sectional view of a three-piece solid golf ball according to one embodiment of the invention.

FIG. 2 is a schematic cross-sectional view of a dimple illustrating how to calculate V_0 .

FIG. 3 is a perspective view of the same dimple.

FIG. 4 is a cross-sectional view of the same dimple.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1, a three-piece solid golf ball 1 according to the invention is illustrated as comprising a solid core 2 having an optimized hardness distribution, a hard intermediate layer 3, and a soft cover 4.

In the golf ball 1 of the invention, the hardness distribution of the solid core 2 is optimized. More particularly, the core 2 is formed to have a center hardness of up to 75 degrees, preferably 60 to 73 degrees, more preferably 63 to 69 degrees as measured by a JIS-C scale hardness meter. The core 2 is also formed to have a surface hardness of up to 85 degrees, preferably 70 to 83 degrees, more preferably 73 to 80 degrees. If the core center hardness exceeds 75 degrees and the surface hardness exceeds 85 degrees, the hitting feel becomes hard, contradicting the object of the invention. It is noted that the hardness referred to herein is JIS-C scale hardness unless otherwise stated.

The core is formed herein such that the surface hardness is higher than the center hardness by 8 to 20 degrees, preferably 10 to 18 degrees. A hardness difference of less than 8 degrees would result in a hard hitting feel provided that the ball hardness and the core surface hardness are fixed. A hardness difference of more than 20 degrees would fail to provide sufficient restitution provided that the ball hardness and the core surface hardness are fixed. The hardness distribution establishing such a hardness difference between the surface and the center of the core ensures that the core surface formed harder than the core center is effective for preventing excessive deformation of the core and efficiently converting distortion energy into reaction energy when the ball is deformed upon impact. Additionally, a pleasant feeling is obtainable from the core center softer than the core surface.

The hardness distribution of the solid core is not limited insofar as the core is formed such that the core surface is harder than the core center by 8 to 20 degrees. It is preferable from the standpoint of efficient energy transfer that the core is formed such that the core becomes gradually softer from its surface toward its center.

The solid core preferably has a diameter of 34 to 41 mm, especially 34.5 to 40 mm. No particular limit is imposed on the overall hardness, weight and specific gravity of the core and they are suitably adjusted insofar as the objects of the invention are attainable. Usually, the core has an overall hardness corresponding to a distortion of 2.5 to 4.5 mm, especially 2.8 to 4 mm under a load of 100 kg applied, and a weight of 20 to 40 grams, especially 23 to 37 grams.

In the practice of the invention, no particular limit is imposed on the core-forming composition from which the solid core is formed. The solid core may be formed using a base rubber, a crosslinking agent, a co-crosslinking agent, and an inert filler as used in the formation of conventional solid cores. The base rubber used herein may be natural rubber and/or synthetic rubber conventionally used in solid golf balls although 1,4-cis-polybutadiene having at least

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40% of cis-structure is especially preferred in the invention. The polybutadiene may be blended with a suitable amount of natural rubber, polyisoprene rubber, styrenebutadiene rubber or the like if desired. The crosslinking agent includes organic peroxides such as dicumyl peroxide, di-t-butyl peroxide, and 1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane, with a blend of dicumyl peroxide and 1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane being preferred. In order to form a solid core so as to have the above-defined hardness distribution, it is preferable to use a blend of dicumyl peroxide and 1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane as the crosslinking agent and the step of vulcanizing at 160° C. for 20 minutes. It is noted that the amount of the crosslinking agent blended is suitably determined although it is usually about 0.5 to 3 parts by weight per 100 parts by weight of the base rubber. The co-crosslinking agent used herein is not critical. Examples include metal salts of unsaturated fatty acids, *inter alia*, zinc and magnesium salts of unsaturated fatty acids having 3 to 8 carbon atoms (e.g., acrylic acid and methacrylic acid), with zinc acrylate being especially preferred. Examples of the inert filler include zinc oxide, barium sulfate, silica, calcium carbonate, and zinc carbonate, with zinc oxide and barium sulfate being often used. The amount of the filler blended is usually up to 40 parts by weight per 100 parts by weight of the base rubber although the amount largely varies with the specific gravity of the core and cover, the standard weight of the ball, and other factors and is not critical. In the practice of the invention, the overall hardness and weight of the core can be adjusted to optimum values by properly adjusting the amounts of the crosslinking agent and filler (typically zinc oxide and barium sulfate) blended.

The core-forming composition obtained by blending the above-mentioned components is generally milled in a conventional mixer such as a Banbury mixer and roll mill, compression or injection molded in a core mold, and then heat cured under the above-mentioned temperature condition, whereby a solid core having an optimum hardness distribution is obtainable.

The intermediate layer 3 enclosing the core 2 is preferably formed to a JIS-C hardness of 75 to 100 degrees, more preferably 80 to 98 degrees. The intermediate layer is formed to a hardness higher than the core surface hardness by at least 5 degrees, preferably 5 to 20 degrees, more preferably by 7 to 18 degrees. A hardness difference of less than 5 degrees would fail to provide sufficient restitution whereas a hardness difference of more than 20 degrees would result in a dull and rather hard hitting feel. The restitution of the core can be maintained by forming the intermediate layer to a higher hardness than the core surface hardness.

The gage, specific gravity and other parameters of the intermediate layer may be properly adjusted insofar as the objects of the invention are attainable. Preferably the gage is 0.2 to 3 mm, especially 0.7 to 2.3 mm and the specific gravity is 0.9 to less than 1.2, especially 0.94 to 1.15.

Since the intermediate layer 3 serves to compensate for a loss of restitution of the solid core which is formed soft, it is formed of a material having improved restitution insofar as a hardness within the above-defined range is achievable. Use is preferably made of a blend of ionomer resins such as Himilan (manufactured by Mitsui-duPont Polychemical K.K.) and Surlyn (E.I. duPont) as will be described later in Table 2. An intermediate layer-forming composition may be obtained by adding to the ionomer resin, additives, for example, an inorganic filler such as zinc oxide and barium sulfate as a weight adjuster and a coloring agent such as titanium dioxide.

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The cover 4 enclosing the intermediate layer 3 must be formed to a lower hardness than the intermediate layer. That is, the cover has a hardness lower than the intermediate layer hardness by at least 5 degrees. Additionally, the cover is preferably formed to a JIS-C hardness of up to 90 degrees, more preferably 70 to 90 degrees, most preferably 75 to 87 degrees when spin properties in an approach range are of much account. A cover hardness in excess of 90 degrees on JIS-C scale would adversely affect the spin properties in an approach range so that professional and skilled amateur players who prefer accurate control reject use in the game. A cover hardness of less than 70 degrees would result in a ball losing restitution.

The gage, specific gravity and other parameters of the cover may be properly adjusted insofar as the objects of the invention are attainable. Preferably the gage is 0.2 to 3 mm, especially 0.7 to 2.3 mm and the specific gravity is 0.9 to less than 1.2, especially 0.93 to 1.15. The gage of the intermediate layer and cover combined is preferably 2 to 4.5 mm, especially 2.2 to 4.2 mm.

The cover composition is not critical and the cover may be formed of any of well-known stock materials having appropriate properties as golf ball cover stocks. For example, ionomer resins, polyester elastomers, and polyamide elastomers may be used alone or in admixture with urethane resins and ethylene-vinyl acetate copolymers. Thermoplastic resin base compositions are especially preferred. UV absorbers, antioxidants and dispersing aids such as metal soaps may be added to the cover composition if necessary. The method of applying the cover is not critical. The cover is generally formed over the core by surrounding the core by a pair of preformed hemispherical cups followed by heat compression molding or by injection molding the cover composition over the core.

Like conventional golf balls, the three-piece solid golf ball of the invention is formed with a multiplicity of dimples in the cover surface. The golf ball of the invention is formed with dimples such that, provided that the golf ball is a sphere defining a phantom spherical surface, the proportion of the surface area of the phantom spherical surface delimited by the edge of respective dimples relative to the overall surface area of the phantom spherical surface, that is the percent occupation of the ball surface by the dimples is at least 62%, preferably 63 to 85%. With a dimple occupation of less than 62%, the above-mentioned flight performance, especially an increased flight distance is not expectable. The total number of dimples is preferably 360 to 450, more preferably 370 to 440. There may be two or more types of dimples which are different in diameter and/or depth. It is preferred that the dimples have a diameter of 2.2 to 4.5 mm and a depth of 0.12 to 0.23 mm. The arrangement of dimples may be selected from regular octahedral, dodecahedral, and icosahedral arrangements as in conventional golf balls while the pattern formed by thus arranged dimples may be any of square, hexagon, pentagon, and triangle patterns.

Moreover, the dimples are preferably formed such that V_0 is 0.39 to 0.6, especially 0.41 to 0.58 wherein V_0 is the volume of the dimple space below a plane circumscribed by the dimple edge divided by the volume of a cylinder whose bottom is the plane and whose height is the maximum depth of the dimple from the bottom.

Now the shape of dimples is described in further detail. In the event that the planar shape of a dimple is circular, as shown in FIG. 2, a phantom sphere 6 having the ball diameter and another phantom sphere 7 having a diameter smaller by 0.16 mm than the ball diameter are drawn in

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conjunction with a dimple 5. The circumference of the other sphere 7 intersects with the dimple 5 at a point 8. A tangent 9 at intersection 8 intersects with the phantom sphere 6 at a point 10 while a series of intersections 6 define a dimple edge 11. The dimple edge 11 is so defined for the reason that otherwise, the exact position of the dimple edge cannot be determined because the actual edge of the dimple 5 is rounded. The dimple edge 11 circumscribes a plane 12 (having a diameter D_m). Then as shown in FIGS. 3 and 4, the dimple space 13 located below the plane 12 has a volume V_p . A cylinder 14 whose bottom is the plane 12 and whose height is the maximum depth D_p of the dimple from the bottom or circular plane 12 has a volume V_q . The ratio V_0 of the dimple space volume V_p to the cylinder volume V_q is calculated.

$$V_p = \int_0^{\frac{D_m}{2}} 2\pi xy dx$$

$$V_q = \frac{\pi D_m^2 D_p}{4}$$

$$V_0 = \frac{V_p}{V_q}$$

In the event that the planar shape of a dimple is not circular, the maximum diameter or length of a dimple is determined, the plane projected shape of the dimple is assumed to be a circle having a diameter equal to this maximum diameter or length, and V_0 is calculated as above based on this assumption.

Furthermore, provided that the number of types of dimples formed in the ball surface is n wherein $n \geq 2$, preferably $n=2$ to 6, more preferably $n=3$ to 5, and the respective types of dimples have a diameter D_{mk} , a maximum depth D_{pk} , and a number N_k wherein $k=1, 2, 3, \dots, n$, the golf ball of the invention prefers that an index D_{st} of overall dimple surface area given by the following equation (1) is at least 4, more preferably 4 to 8.

$$D_{st} = \frac{n \sum_{k=1}^n [(D_{mk}^2 + D_{pk}^2) \times V_0 k \times N_k]}{4R^2} \quad (1)$$

Note that R is a ball radius, V_0 is as defined above, and N_k is the number of dimples k . The index D_{st} of overall dimple surface area is useful in optimizing various dimple parameters so as to allow the golf ball of the invention having the above-mentioned solid core and cover to travel a further distance. When the index D_{st} of overall dimple surface area is equal to or greater than 4, the aerodynamics (flying distance and flight-in-wind) of the golf ball are further enhanced.

While the three-piece solid golf ball of the invention is constructed as mentioned above, other ball parameters including weight and diameter are properly determined in accordance with the Rules of Golf.

The three-piece solid golf ball of the invention will travel an increased flight distance on full shots with a driver and be easy to control on approach shots with No. 5 iron or sand wedge.

EXAMPLE

Examples of the present invention are given below together with Comparative Examples by way of illustration and not by way of limitation. The amounts of components in the core, intermediate layer, and cover as reported in Tables 1 and 2 are all parts by weight.

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Examples 1-5 and Comparative Examples 1-4

Solid cores, Nos. 1 to 6, were prepared by kneading components in the formulation shown in Table 1 to form a rubber composition and molding and vulcanizing it in a mold under conditions as shown in Table 1. The cores were measured for JIS-C hardness and diameter, with the results shown in Tables 3 and 4. The JIS-C hardness of the core was measured by cutting the core into halves, and measuring the hardness at the center (center hardness) and the hardness at core surface or spherical surface (surface hardness). The result is an average of five measurements.

TABLE 1

Core No.	1	2	3	4	5	6
Formulation						
Cis-1,4-polybutadiene rubber	100	100	100	100	100	100
Zinc acrylate	24	24	25	29	15	34
Zinc oxide	29	26	34	27	33	25
Diisobutyl peroxide	1	1	1	1	1	0
^{a1}	0.3	0.3	0.3	0.3	0.3	1
Vulcanizing conditions						
Temperature, °C.	160	160	160	160	160	155
Time, min.	20	20	20	20	20	15
Core hardness ^{a2} , mm	3.7	3.7	3.5	3	5.7	2.2

^{a1}1,1-bis(t-butylperoxy)-3,3,5-trimethylcyclohexane (trade name Perhexa 3M-40 manufactured by Nippon Oil and Fats K.K.)

^{a2}distortion under a load of 100 kg

Next, compositions for the intermediate layer and cover were milled as shown in Table 2 and injection molded over the solid core and the intermediate layer, respectively, obtaining three-piece solid golf balls as shown in Table 4. At the same time as injection molding, two or three types of dimples were indented in the cover surface as shown in Table 3. Whenever the intermediate layer and cover were molded, the intermediate layer and cover were measured for JIS-C hardness, specific gravity and gage. The results are also shown in Table 4.

TABLE 2

Intermediate layer and cover formulations (pbw)					
	A	B	C	D	E
Himilan 1557 ^{a3}	50	—	50	—	—
Himilan 1601 ^{a3}	—	—	50	—	—
Himilan 1605 ^{a3}	50	50	—	—	—
Himilan 1855 ^{a3}	—	—	—	50	50
Himilan 1856 ^{a3}	—	—	—	—	50
Himilan 1706 ^{a3}	—	50	—	—	—
Suriyn 8120 ^{a4}	—	—	—	50	—

^{a3}ionomer resin manufactured by Mitsui-duPont Polychemical K.K.

^{a4}ionomer resin manufactured by E.I. duPont of USA

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TABLE 3

Dimple						
Dimple set	Diameter (mm)	Depth (mm)	V ₀	Number	Dist	Surface occupation (%)
I	4.000	0.200	0.50	72	4.539	75
	3.850	0.193	0.50	200		
	3.400	0.170	0.50	120		
				total 392		
II	3.800	0.205	0.48	162	4.263	74
	3.600	0.194	0.48	86		
	3.450	0.186	0.48	162		
				total 410		
III	3.400	0.195	0.39	360	2.148	61
	2.450	0.195	0.39	140		
				total 500		

The thus obtained golf balls were evaluated for flight performance, spin, feel, spin control, and durability by the following tests.

Flight performance

Using a hitting machine manufactured by True Temper Co., the ball was actually hit with a driver (#W1) at a head speed of 45 m/s (HS45) and 35 m/sec. (HS35) to measure a spin, carry, and total distance.

Feel

Five golfers with a head speed of 45 m/sec. (HS45) and five golfers with a head speed of 35 m/sec. (HS35) actually hit the balls. The ball was rated according to the following criterion.

○:soft

△:ordinary

X:hard

Spin control

Three professional golfers actually hit the ball with No. 5 iron (#I5) to examine intentional hook and slice and stoppage on the green and also with a sand wedge (#SW) to examine spin on 30 and 80 yard shots (that is, stoppage on the green and ease of capture of the ball upon impact). An overall rating of the ball was derived from these spin control factors. The ball was rated "○" for easy control, "△" for ordinary, and "X" for difficult control.

Durability

Durability against continuous strikes and durability against cutting were evaluated in combination. The ball was rated according to the following criterion.

○:excellent

△:ordinary

X:inferior

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TABLE 4

	Examples					Comparative Examples			
	1	2	3	4	5	1	2	3	4
<u>Core</u>									
Type	1	2	3	4	1	1	5	6	4
Center hardness	64	64	65	68	64	64	52	80	68
A (JIS-C)									
Surface hardness	75	75	77	82	75	75	62	90	82
B (JIS-C)									
B - A	11	11	12	14	11	11	10	10	14
Diameter (mm)	36.5	37.9	35.1	37.9	36.5	36.5	36.5	36.5	37.9
<u>Intermediate layer</u>									
Type	A	A	B	B	C	A	D	B	A
Hardness C	86	86	93	93	83	86	75	93	86
(JIS-C)									
C - B	11	11	16	11	8	11	13	3	4
Specific gravity	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Gage (mm)	1.6	1.2	1.8	1.2	1.6	1.6	1.6	1.6	1.8
<u>Cover</u>									
Type	E	E	C	F	D	E	B	A	B
Hardness D	80	80	83	80	75	81	93	86	93
(JIS-C)									
D - C	-6	-6	-10	-13	-8	-5	18	-7	7
Specific gravity	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Gage (mm)	1.5	1.5	2.0	1.5	1.5	1.5	1.5	3.5	2.0
Intermediate layer/cover combined gage (mm)	3.1	2.7	3.8	2.7	3.1	3.1	3.1	5.1	3.8
Dimple set	I	I	II	II	II	III	I	I	I
Ball outer diameter (mm)	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7
<u>#W1/HS45</u>									
Spin (rpm)	2800	2750	2900	2700	2950	2800	2650	2700	2680
Carry (m)	209.0	210.0	210.0	209.5	210.5	207.0	209.0	207.5	208.5
Total (m)	223.0	224.5	223.5	222.0	224.0	218.0	221.0	217.0	218.0
Feel	○	○	○	○	○	○	Δ	X	X
<u>#W1/HS35</u>									
Spin (rpm)	4600	4400	4650	4700	4750	4600	4600	4680	4630
Carry (m)	142.0	144.0	142.5	144.0	143.0	138.0	142.5	139.0	140.0
Total (m)	150.0	153.0	150.0	152.5	152.0	145.0	149.5	145.5	148.0
Feel	○	○	○	○	Δ	○	Δ	X	X
Spin control	○	○	○	○	○	○	X	Δ	X
Durability	○	○	○	○	○	○	X	Δ	Δ

Note:

A hardness difference is represented by (B - A), (C - B), and (D - C). (B - A) is equal to the core surface hardness minus the core center hardness; (C - B) is equal to the intermediate layer hardness minus the core surface hardness; and (D - C) is equal to the cover hardness minus the intermediate layer hardness.

As is evident from Table 4, the ball of Comparative Example 1 which is identical with the ball of Example 1 except for the dimple set is unsatisfactory in flight distance because the dimple surface occupation is as low as 61%. The ball of Comparative Example 2 is inferior in hitting feel, spin control, and durability since the cover is harder than the intermediate layer. The ball of Comparative Example 3 is unsatisfactory in flight distance and hitting feel because the core surface hardness and core center hardness are too high and the hardness difference between the intermediate layer and the core surface is too small. The ball of Comparative Example 4 is inferior in flight distance, hitting feel, and spin control since the cover is harder than the intermediate layer and the intermediate layer is insufficiently harder than the core.

In contrast, the golf balls of Examples 1 to 5 within the scope of the invention receive an appropriate spin rate upon full shots with a driver to travel a longer flight distance, are easy to spin control upon approach shots, and are excellent in both hitting feel and durability.

Japanese Patent Application No. 82121/1996 is incorporated herein by reference.

Although some preferred embodiments have been described, many modifications and variations may be made thereto in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

We claim:

1. A three-piece solid golf ball of the three-layer structure comprising a solid core, an intermediate layer, and a cover, having a plurality of dimples in the ball surface wherein

the solid core, intermediate layer, and cover each have a hardness as measured by a JIS-C scale hardness meter wherein the core center hardness is up to 75 degrees, the core surface hardness is up to 85 degrees, the core surface hardness is higher than the core center hardness by 8 to 20 degrees, the intermediate layer hardness is higher than the core surface hardness by at least 5 degrees, and the cover hardness is lower than the intermediate layer hardness by at least 5 degrees, and the dimples occupy at least 62% of the ball surface.

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2. The three-piece solid golf ball of claim 1 wherein said intermediate layer has a gage of 0.2 to 3 mm and a specific gravity of 0.9 to less than 1.2.

3. The three-piece solid golf ball of claim 1 wherein said cover is based on a thermoplastic resin and has a hardness of up to 90 degrees as measured by the JIS-C scale hardness meter.

4. The three-piece solid golf ball of claim 1 wherein said cover has a gage of 0.2 to 3 mm and a specific gravity of 0.9 to less than 1.2.

5. The three-piece solid golf ball of claim 1 wherein said solid core is formed of a cis-1,4-polybutadiene base elastomer and has a diameter of 34 to 41 mm.

6. The three-piece solid golf ball of claim 1 wherein the dimples in the ball surface total in number to 360 to 450 and include at least two types of dimples having different

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diameters, and an index (Dst) of overall dimple surface area given by the following expression is at least 4.

$$Dst = \frac{\sum_{k=1}^n [(Dmk^2 + Dpk^2) \pi V_0 k Nk]}{4R^2}$$

wherein R is a ball radius, n is the number of dimple types ($n \geq 2$), Dmk is a diameter of dimples k, Dpk is a depth of dimples k, Nk is the number of dimples k wherein $k=1, 2, 3, \dots, n$, and V_0 is the volume of the dimple space below a plane circumscribed by the dimple edge divided by the volume of a cylinder whose bottom is the plane and whose height is the maximum depth of the dimple from the bottom.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,782,707
DATED : July 21, 1998
INVENTOR(S) : Hisashi Yamagishi et al.

Page 1 of 2

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Please add claims 7-17 as follows:

7. The three-piece solid golf ball of claim 6 wherein D_{mk} is in the range of 2.2 to 4.5 and D_{pk} is in the range of 0.12 to 0.23 mm.
8. The three-piece solid golf ball of claim 6 wherein V_0 is in the range of 0.39 to 0.6.
9. The three-piece solid golf ball of claim 1 wherein said core center hardness is in the range of 60 to 73 as measured on JIS-C.
10. The three-piece solid golf ball of claim 1 wherein said core has a surface hardness in the range of 70 to 83 degrees on JIS-C.
11. The three-piece solid golf ball of claim 1 wherein said core surface hardness is higher than the center hardness by 10 to 18 degrees.
12. The three-piece solid golf ball of claim 1 wherein said solid core has a distortion in the range of 2.5 to 4.5 mm under an applied load of 100 kg.
13. The three-piece solid golf ball of claim 1 wherein said intermediate layer has a hardness in the range of 75 to 100 degrees measured on JIS-C.
14. The three-piece solid golf ball of claim 1 wherein said intermediate layer has a hardness higher than the core surface hardness by t to 20 degrees.
15. The three-piece solid golf ball of claim 1 wherein said cover has a hardness in the range of 70 to 90 degrees measured on JIS-C.

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,782,707
DATED : July 21, 1998
INVENTOR(S) : Hisashi Yamagishi et al.

Page 2 of 2

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

16. The three-piece solid golf ball of claim 1 wherein the gage of the intermediate layer and the cover combined is in the range of 2 to 4.5 mm.

17. The three-piece solid golf ball of claim 1 wherein said dimples occupy 63 to 85% of the ball surface

Signed and Sealed this

Sixth Day of November, 2001

Attest:

Nicholas P. Godici

Attesting Officer

NICHOLAS P. GODICI
Acting Director of the United States Patent and Trademark Office

EXHIBIT 13

Core #	Surface					Ave. Surface	5mm					Ave. 5mm	Difference
E13	82.4	81.6	81.6	81.4	81.8	72.3	71.1	72.6	71.8	72.0	9.8		
E14	81.7	81.8	81.6	81.2	81.6	71.3	71.2	71.6	71.9	71.5	10.1		
E15	80.3	80.5	81.6	81.5	81.0	70.9	71.3	70.8	71.2	71.1	9.9		
E16	80.8	80.9	82.1	81.7	81.4	71.9	71.7	72.5	71.8	72.0	9.4		
E17	81.9	81.5	82.0	82.0	81.9	72.3	72.4	73.0	72.3	72.5	9.3		
E18	81.5	81.9	81.8	81.6	81.7	72.6	71.7	72.0	72.0	72.1	9.6		
E19	82.3	82.5	81.5	81.3	81.9	72.8	72.8	73.1	73.0	72.9	9.0		
E20	81.3	81.0	81.8	82.5	81.7	73.0	72.7	72.9	74.1	73.2	8.5		
E21	80.3	81.2	80.8	81.2	80.9	72.2	73.1	72.0	73.0	72.6	8.3		
E22	82.4	81.5	81.1	81.2	81.6	73.7	72.7	73.6	72.1	73.0	8.5		
E23	80.6	82.0	80.8	81.9	81.3	73.7	73.7	72.7	72.9	73.3	8.1		
E24	80.7	80.3	81.6	81.6	81.1	70.7	71.3	71.0	70.7	70.9	10.1		
										Ave Diff =	9.2		

EXHIBIT 14

**THIS EXHIBIT HAS BEEN
REDACTED IN ITS ENTIRETY**

EXHIBIT 15

**THIS EXHIBIT HAS BEEN
REDACTED IN ITS ENTIRETY**

EXHIBIT 16



US005803833A

United States Patent [19]

Nakamura et al.

[11] **Patent Number:** 5,803,833[45] **Date of Patent:** Sep. 8, 1998[54] **TWO-PIECE SOLID GOLF BALL**

[75] Inventors: Atsushi Nakamura; Hisashi Yamagishi, both of Chichibu, Japan

[73] Assignee: Bridgestone Sports Co., Ltd., Tokyo, Japan

[21] Appl. No.: 797,609

[22] Filed: Feb. 7, 1997

[30] **Foreign Application Priority Data**

Feb. 7, 1996 [JP] Japan 8-045444

[51] Int. Cl.⁶ A63B 37/06; A63B 37/12

[52] U.S. Cl. 473/377; 473/378; 273/DIG. 20

[58] Field of Search 473/377, 378; 273/DIG. 20

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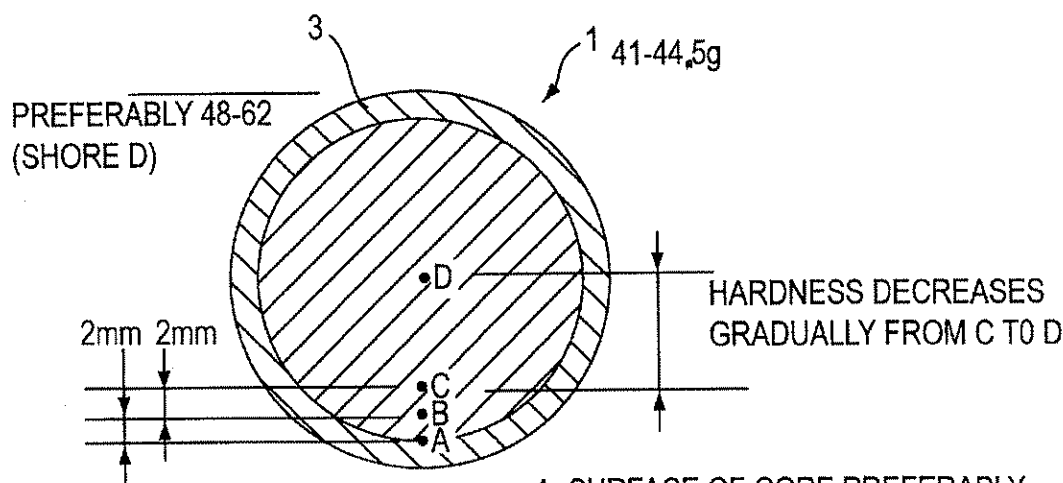
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Primary Examiner—George J. Marlo
 Attorney, Agent, or Firm—Sughrue, Mion, Zinn, Macpeak & Seas, PLLC

[57] **ABSTRACT**

A two-piece solid golf ball comprising a solid core and a cover has a weight of 41–44.5 grams. The solid core has such a distribution of hardness as measured by a JIS-C scale hardness meter that the hardness at 2 mm inside the core surface is at least 2° lower than the hardness at the core surface and the hardness at 4 mm inside the core surface and the hardness gradually decreases from 4 mm inside the core surface to the core center. The ball offers all-around performance satisfying trajectory, carry, feeling, durability and spin to those players who are short in hitting the ball high and far despite a relatively high head speed.

3 Claims, 1 Drawing Sheet

A: SURFACE OF CORE PREFERABLY 65-90 JIS-C HARDNESS.

B: 2mm INSIDE OF A
 LOWER JIS-C THAN AT A BY 2 MINIMUM
 AND LOWER JIS-C THAN AT
 C' BY 2 MINIMUM

C: 4mm INSIDE OF A

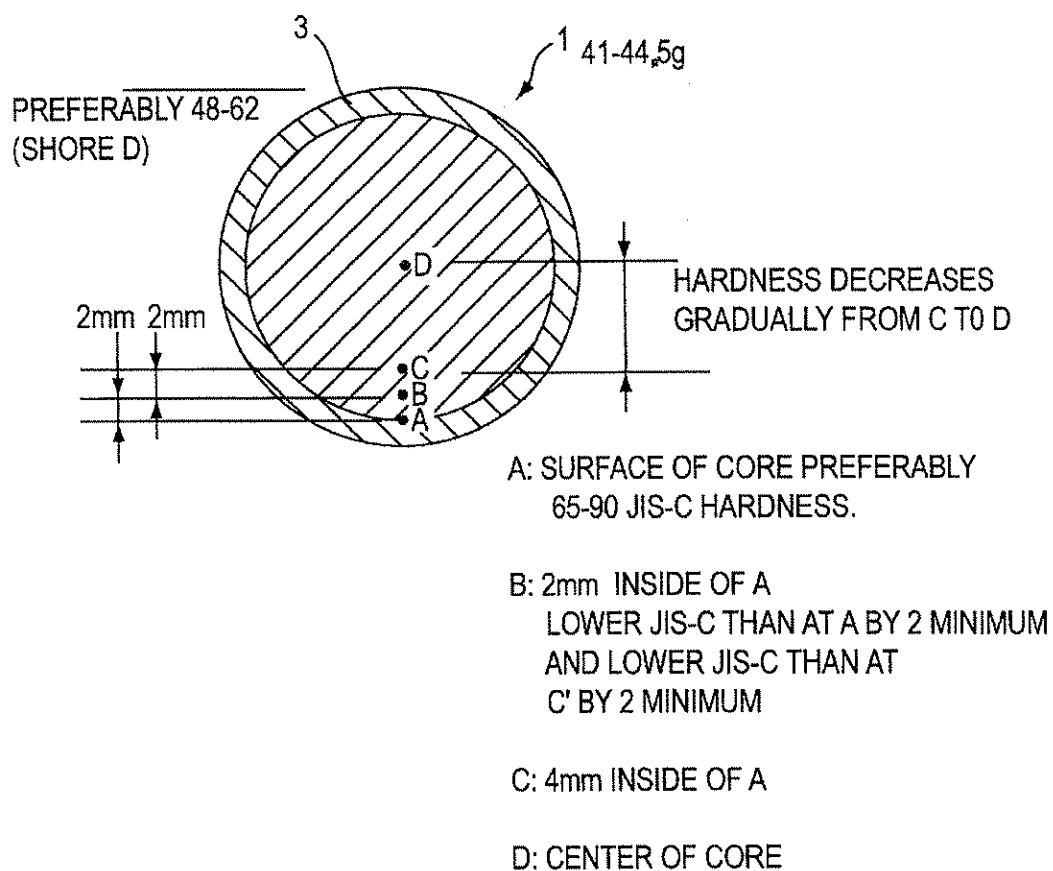
D: CENTER OF CORE

U.S. Patent

Sep. 8, 1998

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FIG. 1



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TWO-PIECE SOLID GOLF BALL**BACKGROUND OF THE INVENTION****1. Field of the Invention**

This invention relates to a two-piece solid golf ball.

2. Prior Art

As the number of golf players increases in these years, the demand for golf balls with respect to their playability factors such as flight, feeling, durability and spin is diversified so as to meet the level of individual players including professional, low-handicap, average, and novice players. Nevertheless, most of advanced golf balls currently available are constructed with a focus on low-handicap players who swing at a high head speed.

Under such circumstances, those golf players who are slow in head speed, including beginner, female and senior players cannot take full advantages of the advanced balls including increased carry and pleasant feel. The reason is that the flight performance is more dependent on a head speed since a weaker force applied to the ball upon impact causes a smaller deformation to the ball.

The advanced balls are also unsatisfactory to those players who swing at a relatively high head speed, but fail to gain a long distance because of low trajectory upon shots with a driver or long iron.

Lightweight golf balls have been proposed in various versions. Such lightweight golf balls are mainly targeted for low-head speed players. Japanese Patent Application Kokai (JP-A) No. 109971/1992 proposes to impart a hardness distribution to the core at no sacrifice of feeling and durability. The ball is improved in feeling by providing a core hardness distribution determined with stress concentration taken into account while restitution is maintained. The ball is not yet adequate to those players who swing at a relatively high head speed, but fail to gain a long distance because of low trajectory.

SUMMARY OF THE INVENTION

Therefore, an object of the invention is to provide a two-piece solid golf ball which offers all-around performance satisfying such playability factors as trajectory, carry, feeling, durability and spin to those players who swing at a relatively high head speed, but fail to hit the ball high and far with a driver or long iron.

We have found that the above object can be attained by controlling the weight and core hardness distribution of a two-piece solid golf ball. (1) The ball should have a weight of 41 to 44.5 grams, which is lighter than ordinary golf balls. (2) With stress concentration taken into account, the hardness distribution of the core is adjusted such that the hardness at 2 mm inside the core surface is at least 2° lower than the hardness at the core surface and the hardness at 4 mm inside the core surface, and the hardness gradually decreases from 4 mm inside the core surface to the core center. Note that the hardness is as measured by a JIS-C scale hardness meter. Then the ball will follow a higher trajectory and gain a higher initial velocity on actual shots, traveling a longer distance. The hardness distribution of the core ensures a more pleasant feel while maintaining high restitution. If the core is formed relatively soft, then the ball presents a very soft feel. If the core is formed relatively hard, then the ball presents a pleasant feel. Consequently, if the core is formed relatively hard with the target placed on those players who can swing at a relatively high head speed, but suffer from a relatively low trajectory and a less satisfactory

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flight distance upon shots with a driver or long iron, the ball enables high trajectory shots with a pleasant feel. The ball is further improved in spin, feel and durability particularly when the cover has a hardness in the range of 48 to 62 on Shore D hardness scale. The present invention is predicated on these findings.

Accordingly, the present invention provides a two-piece solid golf ball comprising a solid core having a spherical surface and a cover enclosing the core, wherein the golf ball has a weight of 41 to 44.5 grams, and the solid core has such a distribution of hardness as measured by a JIS-C scale hardness meter that the hardness at 2 mm inside the core surface is at least 2° lower than the hardness at the core surface and the hardness at 4 mm inside the core surface and the hardness gradually decreases from 4 mm inside the core surface to the core center. Preferably the solid core has a hardness of 65° to 90° at the surface as measured by a JIS-C hardness meter. Also preferably the cover has a Shore D hardness of 48 to 62.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the golf ball of the invention.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is directed to a 2-piece solid golf ball comprising a spherical solid core and a concentric cover. According to the invention, the ball is lightweight, that is, has a weight of 41 to 44.5 grams, preferably 42 to 44 grams. If the ball weight is less than 41 grams, the ball is too light to travel a long distance. Balls having a weight of more than 44.5 grams have no significant difference from conventional solid golf balls and fail to attain the objects of the invention.

In addition to the weight requirement, the 2-piece solid golf ball of the invention requires that the hardness distribution of the core be optimized in consideration of stress concentration. When the solid core is measured for hardness by a JIS-C scale hardness meter, the core has a hardness on its spherical surface (to be referred to as surface hardness, hereinafter), a hardness at a position located 2 mm inside the surface in a radial direction, a hardness at a position located 4 mm inside the surface in a radial direction, and a hardness at the center (to be referred to as center hardness, hereinafter). The surface hardness is an average of five measurements at arbitrary five points on the core surface.

The surface hardness should preferably be 65° to 90°, more preferably 70° to 87°, most preferably 78° to 85°. If the surface hardness of the core is less than 65°, then the core would be too soft to travel a long distance. If the surface hardness of the core is more than 90°, then the core would be too hard to present a pleasant feel.

The hardness at 2 mm inside the core surface should be at least 2°, preferably at least 5° lower than the surface hardness and the hardness at 4 mm inside the core surface. The hardness at 2 mm inside the core surface should preferably be at least 60°, more preferably at least 65° in order to avoid a loss of restitution.

Preferably the hardness at 4 mm inside the core surface should be 0° to 2° lower than the surface hardness. The hardness at 4 mm inside the core surface is approximately equal to the surface hardness and preferably ranges from 65° to 88°, especially 68° to 85°.

Further the hardness should gradually decrease from 4 mm inside the core surface to the core center. The center hardness is preferably 50° to 70°, especially 50° to 60°.

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A solid core having the above-defined hardness distribution may be formed by blending a base rubber with a mixture of dicumyl peroxide and 1,1-bis-3,3,5-trimethylcyclohexane as a crosslinking agent and vulcanizing the rubber at 160° C. for 20 minutes.

The solid core as a whole should preferably have a distortion of 1.8 to 5.0 mm, especially 3.0 to 4.7 mm under a load of 100 kg. Although the diameter, weight and specific gravity are not critical, the solid core preferably has a diameter of 37.0 to 41.0 mm, especially 38.0 to 40.0 mm and a weight of 27.0 to 40.0 grams, especially 30.0 to 37.0 grams.

The solid core may be formed from conventional solid core stock materials by conventional methods while formulation and vulcanizing conditions are adjusted so as to meet the core requirement of the invention. Most often, the core is formed of a composition comprising a base rubber, a crosslinking agent, a co-crosslinking agent, and an inert filler as used in the formation of conventional solid cores. The base rubber used herein may be natural rubber and/or synthetic rubber conventionally used in solid golf balls although 1,4-polybutadiene having at least 40% of cis-structure is especially preferred in the invention. The polybutadiene may be blended with a suitable amount of natural rubber, polyisoprene rubber, styrene-butadiene rubber or the like if desired. The crosslinking agent is typically selected from organic peroxides such as dicumyl peroxide, di-*t*-butyl peroxide, and 1,1-bis-3,3,5-trimethylcyclohexane, with a mixture of dicumyl peroxide and 1,1-bis-3,3,5-trimethylcyclohexane being preferred. About 0.5 to 3 parts by weight of the crosslinking agent is generally blended with 100 parts by weight of the base rubber. The co-crosslinking agent is typically selected from metal salts of unsaturated fatty acids, inter alia, zinc and magnesium salts of unsaturated fatty acids having 3 to 8 carbon atoms (e.g., acrylic acid and methacrylic acid) though not limited thereto. Zinc acrylate is especially preferred. Examples of the inert filler include zinc oxide, barium sulfate, silica, calcium carbonate, and zinc carbonate, with zinc oxide and barium sulfate being often used. The amount of the filler blended is preferably up to about 40 parts by weight per 100 parts by weight of the base rubber although the amount largely varies with the specific gravity of the core and cover, the weight of the ball, and other factors. In the practice of the invention, the amounts of the crosslinking agent and filler (typically zinc oxide and barium sulfate) are properly selected so as to provide the desired hardness and weight to the core as a whole.

A core-forming composition is prepared by kneading the above-mentioned components in a conventional mixer such as a Banbury mixer and roll mill, and it is compression or injection molded in a core mold. The molding is then heat cured as previously mentioned, so as to produce a solid core having an optimum hardness distribution.

Next, the cover enclosing the solid core should preferably have a Shore D hardness of 48 to 62, especially 50 to 60. If the Shore D hardness of the cover is less than 48, some balls would provide insufficient restitution and feeling without click. If the Shore D hardness of the cover is more than 62, there is a risk of exacerbating spin and feeling. The gage (radial thickness) of the cover is not critical although it preferably has a gage of 1.2 to 2.5 mm, especially 1.4 to 2.3 mm.

The cover is formed of any well-known cover stock, typically based on an ionomer resin. For example, Surllyn 8220 and 8120 (E. I. duPont) and Himilan 1605, 1601, 1557,

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and 7315 (Mitsui duPont Polychemical K.K.) may be used alone or in admixture of two or more. Also, well-known additives such as titanium dioxide, barium sulfate, and magnesium stearate may be added to the ionomer resin for adjusting a specific gravity and hardness. UV absorbers, antioxidants and dispersing aids such as metal soaps may be added if desired. The cover stock may be molded over the solid core by any desired method, for example, by surrounding the core by a pair of preformed hemispherical cups followed by heat compression molding or by injection molding the cover stock over the core.

The thus obtained golf ball of the invention is conventionally formed with a multiplicity of dimples in the cover surface. The ball is further subject to finishing steps including buffing, painting and stamping.

While the solid golf ball of the invention is constructed as mentioned above, the diameter, initial velocity and symmetry of the ball may be properly selected in accordance with the Rules of Golf.

According to the present invention, a 2-piece solid golf ball characterized by a relatively light weight and an optimum core hardness distribution is best suited for those players who can swing at a relatively high head speed, but suffer from a relatively low trajectory and a less satisfactory flight distance upon shots with a driver or long iron, because the ball offers all-around performance satisfying trajectory, carry, feeling, durability and spin upon shots by such players.

EXAMPLE

Examples of the present invention are given below by way of illustration and not by way of limitation. All parts are by weight.

Examples 1-3 & Comparative Examples 1-2

A solid core was prepared by milling a solid core-forming rubber composition formulated as shown in Table 1 in a roll mill and vulcanizing it in a mold at 160° C. for 20 minutes in Examples 1-3 and Comparative Example 1. In Comparative Example 2, the composition was vulcanized at 120° C. for 80 minutes to produce a core having a flat hardness distribution. A cover stock formulated as shown in Table 1 was then injection molded over the solid core, obtaining 2-piece solid golf balls.

The golf balls were examined for flight performance, spin, feeling, and durability by the following tests.

Flight Test

Using a swing robot, the ball was hit with a driver (#1 W) at a head speed of 45 m/sec. (HS45) for determining a carry, total distance, and angle.

Spin

Using a swing robot, the ball was hit with a sand wedge (#SW) at a head speed of 19 m/sec. (HS19) for determining a spin rate.

Feeling Test

Five players actually hit the ball to judge the hitting feel. The rating was "◎" for a very soft feel, "O" for a soft feel, and "Δ" for a rather hard feel.

Durability

Using a flywheel hitting machine, the ball was repeatedly hit at a head speed of 38 m/sec. until it was broken. In accordance with the count of hits, the ball was rated "◎" for high durability, "O" for acceptable durability, and "X" for poor durability.

The results are shown in Table 1.

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TABLE 1

	E1	E2	E3	CE1	CE2
<u>Core composition (pbw)</u>					
Cis-1,4-polybutadiene rubber	80	85	100	90	100
Polyisoprene rubber	20	15	—	10	—
Zinc acrylate	30	30	23	27	20
Zinc oxide	6	12	12.5	25	14
Dicumyl peroxide	0.9	0.9	0.9	0.9	0.9
1,1-bis-3,3,5-trimethylcyclohexane	0.3	0.3	0.3	0.3	0.3
<u>Cover composition (pbw)</u>					
Surlyn 8220	—	—	—	50	—
Himilan 7315	—	—	—	50	—
Himilan 1605	50	—	—	—	—
Himilan 1557	50	50	60	—	50
Himilan 1601	—	50	—	—	50
Surlyn 8120	—	—	40	—	—
Cover hardness (Shore D)	60	58	53	68	58
Ball weight (g)	42.5	44.0	43.3	45.4	43.3
Core hardness (JIS-C)	Surface	78	80	72	80
	2 mm inside	73	78	66	78
	4 mm inside	77	80	72	80
	Center	65	64	56	64
Performance	#1W/HS45	Carry (m)	209.0	210.5	209.0
		Total (m)	217.5	219.5	218.0
		Angle (°)	12.3	12.0	12.2
		Spin (rpm)	4655	4892	5715
Feel	#SW/HS19		4655	4892	5715
Durability			⊙	⊙	⊙

In Table 1, Surlyn and Himilan are the trade names of ionomer resin commercially available from E. I. duPont and Mitsui duPont Polychemical K.K., respectively.

As seen from Table 1, the ball of Comparative Example 1 has the same core hardness distribution as the ball of Example 2, but is different in ball weight and cover Shore D hardness. The ball of Comparative Example 1 follows a relatively low trajectory and does not travel a satisfactory distance because of the heavy weight and is inferior in spin, feel and durability because of the increased hardness of the cover. The ball of Comparative Example 2 which has a soft core and a flat core hardness distribution in that the hardness remains equal at the surface, 2 mm inside the surface and 4 mm inside the surface does not travel a satisfactory distance and presents an unpleasant feel.

In contrast, the 2-piece solid golf balls having an optimum ball weight, core hardness distribution and cover hardness within the scope of the invention exhibit all-around performance since they follow a relatively high trajectory, travel a satisfactory distance and are improved in spin, feel and durability.

Japanese Patent Application No. 45444/1996 is incorporated herein by reference.

Although some preferred embodiments have been described, many modifications and variations may be made thereto in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

We claim:

1. A two-piece solid golf ball comprising a solid core having a spherical surface and a cover enclosing the core, wherein

the golf ball has a weight of 41 to 44.5 grams, and said solid core has such a distribution of hardness as measured by a JIS-C scale hardness meter that the hardness at 2 mm inside the core surface is at least 2° lower than the hardness at the core surface and the hardness at 4 mm inside the core surface and the hardness gradually decreases from 4 mm inside the core surface to the core center.

2. The golf ball of claim 1 wherein said solid core has a hardness of 65° to 90° at the surface as measured by a JIS-C scale hardness meter.

3. The golf ball of claim 1 wherein said cover has a Shore D hardness of 48 to 62.

* * * * *

EXHIBIT 17

IN UNITED STATES DISTRICT COURT
DISTRICT OF DELAWARE

BRIDGESTONE SPORTS CO., LTD., and
BRIDGESTONE GOLF, INC.,

Plaintiffs,

v.

ACUSHNET COMPANY,

Defendant.

C.A. No. 05-132(JJF)

DEMAND FOR JURY TRIAL

EXPERT REPORT OF LARRY C. CADORNIGA

Submitted on February 20, 2007

CONTAINS HIGHLY CONFIDENTIAL INFORMATION
SUBJECT TO PROTECTIVE ORDER

Expert Report of Larry C. Cadorniga
Page 49

a. For typical rubber articles, a certain degree of hardness gradient will exist, although the gradient may not be significant.

b. A golf ball core compound which has been formulated with crosslinkers using a peroxide curing system behaves differently. In the art of molding golf ball cores, the chemical reaction between the materials in the core formulation actually creates an exothermic reaction which can yield a higher temperature within the inside of the core. As the specified molding temperature reaches the center of the rubber core, the chemical reaction results in an increase in the temperature (higher than the designated mold temperature) and moves back to the surface and eventually reverses the vulcanizing (curing) phenomenon from "outside-to-inside" to "inside-to-outside." Based on my involvement in studies related to this curing phenomenon this often results in an internal hardness reading being higher than the hardness at the surface of the core, or results in hardness readings consistent throughout the core.

CONTAINS HIGHLY CONFIDENTIAL INFORMATION
SUBJECT TO PROTECTIVE ORDER

EXHIBIT 18

LEXSEE 2007 U.S. DIST. LEXIS 24065

**PRISM TECHNOLOGIES LLC, Plaintiff, v. VERISIGN, INC., RSA SECURITY, INC., NETEGRITY, INC., COMPUTER ASSOCIATES INTERNATIONAL, INC.,
And JOHNSON & JOHNSON SERVICES, INC., Defendants.**

Civil Action No. 05-214-JJF

UNITED STATES DISTRICT COURT FOR THE DISTRICT OF DELAWARE

2007 U.S. Dist. LEXIS 24065

April 2, 2007, Decided

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April 2, 2007
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Joseph Farnan, District Judge.

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OPINION BY: Joseph Farnan

OPINION:

MEMORANDUM OPINION

This action was brought by Plaintiff, Prism Technologies, LLC ("Plaintiff") against Defendants VeriSign, Inc., RSA Security Inc., Netegrity, Inc., Computer Associates International, Inc., and Johnson & Johnson Services, Inc. (collectively "Defendants") alleging infringement of *United States Patent No. 6,516,416* (the "*416 Patent*"). The parties briefed their respective positions on claim construction, and the Court conducted a Markman hearing on November 9, 2006 regarding the disputed terms in the '*416 Patent*'. This Memorandum Opinion presents

[*3] the Court's construction of the disputed terms.

I. Preliminary Matters

Following the Markman Hearing, Plaintiff moved this Court to allow supplementation of the hearing record. (D.I. 376). Plaintiff sought to introduce an expert declaration to counter allegedly new arguments presented by Defendants at the hearing. The Court finds that Defendants did not adopt new positions for the affected terms. Accordingly, Plaintiff's Motion For Leave To Supplement The Markman Hearing Record (D.I. 376) will be denied.

II. Background

The patent-in-suit relates to a subscription access

security system for use with untrusted computer networks. The patented system provides secure access, subscriber and server authentication, subscriber usage tracking, and information rights management. The system seeks to solve problems such as how to generate revenue when users access content on untrusted networks, and how to protect information rights.

III. Legal Standard

A. General Claim Construction Principles

Claim construction is a question of law. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 977-78 (Fed. Cir. 1995), *aff'd*, 517 U.S. 370, 388-90, 116 S. Ct. 1384, 134 L. Ed. 2d 577 (1996).

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[*4] When construing the claims of a patent, a court considers the literal language of the claim, the patent specification and the prosecution history. *Markman*, 52 F.3d at 979. Of these sources, the specification is considered the single best guide for discerning the meaning of a claim. *Phillips v. AWH Corporation*, 415 F.3d 1303, 1312-1317 (Fed. Cir. 2005).

A court may consider extrinsic evidence, including expert and inventor testimony, dictionaries, and learned treatises, in order to assist it in understanding the underlying technology, the meaning of terms to one skilled in the art and how the invention works. *Phillips*,

415 F.3d at 1318-19; *Markman*, 52 F.3d at 979-80 (citations omitted). However, extrinsic evidence is considered less reliable and less useful in claim construction than the patent and its prosecution history. *Phillips*, 415 F.3d at 1318-19 (discussing "flaws" inherent in extrinsic evidence and noting that extrinsic evidence "is unlikely to result in a reliable interpretation of a patent claim scope unless considered in the context of intrinsic evidence").

In addition to these fundamental

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[*5] claim construction principles, a court should also interpret the language in a claim by applying the ordinary and accustomed meaning of the words in the claim. *Envirotech Corp. v. Al George, Inc.*, 730 F.2d 753, 759 (Fed. Cir. 1984). If the patent inventor clearly supplies a different meaning, however, then the claim should be interpreted according to the meaning supplied by the inventor. *Markman*, 52 F.3d at 980 (noting that patentee is free to be his own lexicographer, but emphasizing that any special definitions given to words must be clearly set forth in patent). If possible, claims should be construed to uphold validity. *In re Yamamoto*, 740 F.2d 1569, 1571 &

n.* (Fed. Cir. 1984) (citations omitted).

B. Claim Construction Of Means-Plus-Function and Step-Plus-Function Claim Elements

Under 35 U.S.C. § 112, P 6, a claim limitation may be expressed as a "means or step for performing a specified function without the recital of structure, material, or acts in support thereof." 35 U.S.C. § 112, P 6. When interpreting claims expressed in this manner, "structure" and "material" are associated

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[*6] with means-plus-function claim limitations, whereas "acts" or "steps" are associated with step-plus-function claim limitations. *Seal-Flex, Inc. v. Athletic Track & Court Constr.*, 172 F.3d 836, 843 (Fed. Cir. 1999)(citing *O.I. Corp. v. Tekmar Co. Inc.*, 115 F.3d 1576, 1583 (Fed. Cir. 1997)).

In determining whether a claim element is subject to Section 112, P 6, a court considers the phrasing of the element. Use of the word "means" creates the presumptions that a claim is employing means-plus-function language, and therefore, that Section

112, P 6 applies. Its absence creates a presumption to the contrary. *Mas-Hamilton Group v. Lagard, Inc.*, 156 F.3d 1206, 1213 (Fed. Cir. 1998). In the context of step-plus-function limitations, the same can be said if the element includes the word "step for." *St. Clair Intellectual Prop. Consultants, Inc. v. Canon Inc.*, 2004 U.S. Dist. LEXIS 17489 at *78 (D. Del. 2004)(citing *Seal-Flex, Inc. v. Athletic Track & Ct. Constr.*, 172 F.3d 836, 849 (Fed. Cir. 1999)). A presumption that Section 112, P 6 applies can be overcome by showing that (1) there is no corresponding function

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[*7] for the "means" or (2) the claim recites sufficient structure, material, or acts to perform the function. *Sage Prods. v. Devon Indus.*, 126 F.3d 1420, 1427-28 (Fed. Cir. 1997).

If Section 112, P 6 does apply, a court must first determine the function that is being performed, "staying true to the claim language and the limitations expressly recited by the claims." *Omega Eng'g v. Raytek Corp.*, 334 F.3d 1314, 1322 (Fed. Cir. 2003). Second, a court must determine what structure, material, or acts provided in the written description correspond to the function performed.

Id. A claim governed by section 112, P 6 does not encompass every structure, material, or act that can possibly perform the specified function. *Lairam Corp. v. Rexnord*, 939 F.2d 1533, 1535 (Fed. Cir. 1991). Rather, the limitation must be construed to cover the "corresponding structure, material, or acts described in the specification and equivalents thereof." 35 U.S.C. § 112, P 6; *Odetics, Inc. v. Storage Tech. Corp.*, 185 F.3d 1259, 1266-67 (Fed. Cir. 1999). The claim limitation covers only the structure, material, or acts necessary

[*8] to perform the function. *Omega Eng'g*, 334 F.3d at 1322 (Fed. Cir. 2003).

IV. The Meanings Of The Disputed Terms In The '416 Patent

Though Plaintiff asserts that Defendants infringe independent claims 1 and 24 and dependent claims 4, 5, 15, 16, and 25 of the '416 Patent, the terms that the Court must construe all appear in independent claims 1 and 24. In full, with disputed terms and phrases emphasized, these claims recite:

1. A system for controlling the operation of and access to selected computer resources of at least a first server computer by at least one subscriber client computer via an untrusted network in an operating session, without necessarily controlling access to other computer resources

provided by the first server computer and by other server computers and nonsubscriber client computers, comprising:

clearinghouse means for storing identity data of said first server computer and the identity data of each of said subscriber client computers;

server software means installed on said first server computer adapted to forward its identity data and identity data of each subscriber

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[*9] client computer to said clearinghouse means at the beginning of an operating session in which access to selected computer resources of said first server computer is requested;

client software means installed on each of said subscriber client computers adapted to forward its identity data to said first server computer at the beginning of an operating session in which access to selected computer resources is requested;

at least one hardware key connected to the subscriber client computer, said key being adapted to generate a predetermined digital identification, which

identification is part of said identity data;

said server software means installed on the first server computer being adapted to selectively request the subscriber client computer to forward said predetermined digital identification to the first server computer to thereby confirm that said hardware key is connected to said subscriber client computer;

said clearinghouse means being adapted to authenticate the identity of said subscriber client computer responsive to a request for selected computer resources of said first server

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[*10] computer by a subscriber client computer;

said clearinghouse means being adapted to authenticate the identity of said first server computer responsive to said subscriber client computer making the request for selected computer resources of said first server computer; and,

said clearinghouse means being adapted to permit access to said selected computer resources responsive to successful initial authentication of said first server computer and of said subscriber client computer making first [sic] request.

24. A method of controlling access to selected computer resources of at least a first server computer by at least one subscriber client computer via an untrusted network during an operating session, without necessarily controlling access to other computer resources provided by the first server computer and by other server computers and nonsubscriber client computers, comprising the steps of:

registering identity data of said first server computer and the identity data of each of said subscriber client computers and storing the registered identity data in a clearinghouse means associated

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[*11] with said first server computer and said subscriber client computers;

requiring a subscriber client computer to forward its identity data to said clearinghouse means at the beginning of an operating session in which access to selected computer resources is requested;

requiring a subscriber client computer to forward a predetermined digital identification to said first server computer to thereby confirm that a hardware key is connected to said subscriber client computer;

attempting to authenticate the identity of said subscriber client computer from said clearinghouse

means responsive to a request for selected computer resources of said first server computer by a subscriber client computer;

attempting to authenticate the identity of said first server computer from said clearinghouse means responsive to said subscriber client computer making the request for selected computer resources; and,

permitting access to said selected computer resources responsive to successful initial authentication of said first server computer and of said subscriber client computer making said request.

(*'416 Patent*

[*12] , col. 35, line 25 - col. 26, line 2; col. 28, lines 36 - 67).

The parties have agreed upon definitions, which the Court adopts, for the following terms:

"Authenticate" means "to determine that something is, in fact, what it purports to be" (D.I. 207, pg. 20); "Adapted to forward" means "capable of transmitting" (Id. at pg. 22); "Requiring . . . to forward" means "requiring that certain information be transmitted" (Id.); and "Its" in the context of "its identity data" has two meanings: the first occurrence of "its," in Column 35, line 36, refers to the identity data of a first server computer and the second occurrence of

"its," in Column 35, line 42, refers to the identity data of a subscriber client computer. (Id. at pg. 24).

For the reasons that follow, the Court construes the disputed terms and phrases as follows:

A. Untrusted Network

The parties agree that the patentee explicitly defined the term "untrusted network" in the specification of the '416 Patent. However, they disagree as to whether the patentee's definition comprises one or two sentences. The relevant part of the specification reads:

As used herein,

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[*13] an untrusted network is defined as a public network with no controlling organization, with the path to access the network being undefined and the user being anonymous. A client-server application running over such a network has no control over the transmitted information during all the phases of transmission.

(*'416 Patent*, col. 3, ll. 59-64). Plaintiff contends that "untrusted network" is defined by only the first sentence, whereas Defendants contend that the patentee intended "untrusted network" to be defined by both sentences.

(D.I. 266, pg. 25; D.I. 305, pg. 26; D.I. 268, pg. 39; D.I. 306, pg. 17). Defendants contend that the patentee clearly intended to limit the scope of the term "untrusted network" to "control" over transmitted information, and that desired scope is only apparent when both sentences are read together. (D.I. 268 at 39).

After reviewing the claim language and the specification, the Court concludes that the second sentence explains how an untrusted network acts upon a client-server application, while the first sentence contains the patentee's definition of the term. Accordingly, the Court agrees with Plaintiff, and construes "untrusted network" to mean

[*14] "a public network with no controlling organization, with the path to access the network being undefined and the user being anonymous."

B. Subscriber

Defendants contend that because the claims distinguish between "subscriber client computers" and "non-subscriber client computers," thereby describing some users as subscribers, and some users as non-subscribers, the terms "user" and "subscriber" cannot, as Plaintiff contends, be interchangeable. Moreover, Defendants contend that payment for access to content is a necessary component of the invention, noting that "a prominent feature of the system of the present

invention is that it provides a secure platform [to publish protected resources] in a way that assures revenue generation." (D.I. 268 at 20 citing *'416 Patent*, col. 35, ll. 10-14.). Therefore, Defendants contend, the patent teaches that information providers only provide information to subscribers who pay for access to the content, and deny that right to all other users. (D.I. 268 at 20).

Plaintiff acknowledges that the *'416 Patent* provides the possibility that information providers could collect payment from those who seek access to the providers' content. However,

[*15] Plaintiff contends, collecting fees is not a requirement of the patent, and a user does not become a subscriber only upon paying for access to providers' content. Rather, Plaintiff contends, the terms "subscriber" and "user" are used interchangeably throughout the specification and drawings to refer to someone who has applied, and been approved, to access protected content, with or without paying a fee to do so. (D.I. 266, citing *'416 Patent* col. 1, ll. 63-67, col. 7, ll. 48-53, and Figs. 3, 17, 18).

After reviewing the term "subscriber" in the context of the specification and other claims, the Court agrees with Plaintiff that the *'416 Patent* does not anticipate that all subscribers pay for access to protected content. n1 The opening paragraphs of the specification suggest that one

function of a subscription access system is to help generate revenue, as Defendants point out. (*'416 Patent*, col. 1, l. 13). However, there are other functions, such as to provide protection of information assets. (Id., col. 1, ll. 13-15).

N1 The parties have submitted definitions for the word "user" and "subscriber" from various dictionaries. However, because the Court concludes that the meaning of "subscriber" can be sufficiently construed from the intrinsic evidence, it will not consider which party's dictionary of choice is most appropriate.

[*16]

Also, the specification never requires that the invention be associated with generating revenue, even though the invention provides for such a possibility. (Id. at col. 4, l. 4-5). The specification teaches that each information provider establishes its own criteria for accepting subscribers, and that some possible prerequisites can include "things like collecting payment, demographic checks, etc." (Id. at col. 14, ll. 43-44). While it does provide this list of possible criteria, the specification never requires information providers to include any particular prerequisites for their subscribers.

Moreover, it appears that the patentee intended the terms "user" and "subscriber" to have the same meaning throughout the patent. For example, Column 8, lines 30-33 read: "The functions in the shared object 66 insures that the *subscriber* is operating as a valid session. If it is not a valid session, the functions redirect the *user* to the login process so that a new session can be created for the *subscriber*." ('416 Patent, col. 8, ll. 30-33)(emphasis added). The Court's interpretation does not imply that "subscribers" are synonymous with any computer user. Rather, the

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[*17] Court's reading of the terms "subscriber" and "user" is consistent with the patent specification in distinguishing those who are allowed access to protected content, whether they paid for that access or not, (subscribers/users of the system) from those who are not allowed to access protected content (non-subscribers, who do not use the system).

C. First Server Computer and the "Selected Computer Resources of at least a [or said] first server computer ..."

Plaintiff contends that the first server computer, or "subscription access server," does not need to actually

store all of the selected computer resources it makes available to subscribers. Rather, Plaintiff contends, the first server computer can act as a gatekeeper, controlling access to those resources by instructing a "Service Function" to make those services, applications or content available. (D.I. 266 at 27; D.I. 305 at 17-18).

Defendants contend that the claim language and specification of the '416 Patent require that the first server computer physically store all of the protected content it communicates to subscribers, pointing to language in the specification stating that the invention "control[s] access

[*18] to selected computer resources of at least a first server computer." (D.I. 306 at 20, citing *'416 Patent*, col. 35, ll. 26, 29-31)(emphasis added). Defendants contend that the use of the word "of" implies possession of resources by the first server. (Id. at 20). However, reading the claim in the context of the entire patent, the Court concludes that Defendants' contentions rely on an overly restrictive concept of possession, and that, given a broader reading, the language cited by Defendants is consistent with the specification.

The specification discusses a system whereby

various web sites are hosted through web servers operating in conjunction with first server computers that protect the contents of the sites. (See e.g. col. 5, ll. 14-16, col. 27, ll. 3-4). Figure 3 shows the protected contents residing outside of the first server computer, with the path over which protected contents can be sent crossing through the "Service Function" block rather than the server. (Id., Fig. 3). Likewise, in Figure 4, the protected content resides outside the first server, and is accessed by the server through the "Service Function," which also resides outside the first server computer.

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[*19] (Id., Fig. 4). Thus, the Court concludes that the system disclosed in the specification and corresponding figures does not require the first server computer to store the resources it communicates to subscribers. Rather, it allows the server to act as a gatekeeper, accessing selected computer resources protected by the invention either itself or through a "Service Function" block, and communicating those resources to subscribers.

Accordingly, the Court construes "First Server Computer" to mean "a computer that makes available information or other resources." The Court also construes "selected computer resources of at least a [or said] first server computer" to mean "computer services,

applications, or content that can be accessed by (either directly or indirectly) said first server computer."

D. Operating Session

The parties agree that the term "operating session" refers to communications between the subscriber client computer and the server. Their main point of disagreement is over when it begins and ends.

Plaintiff contends that the language of Claims 1 and 24 provides that an operating session begins when the subscriber client computer's identity data is forwarded

[*20] to the clearinghouse. (D.I. 266, pg. 27). Plaintiff contends that a subscriber is authenticated during an operating session, and authentication cannot be completed without identity data. *Id.* Plaintiff further contends that the inventors intended "beginning" to have its conventional meaning of "the time or place of starting." (*Id.* citing Webster's New Twentieth Century Dictionary (1983)).

Defendants contend that Plaintiff's proposed construction is overly broad, in that it an "operating session" would inappropriately cover communications that never result in a successful log in or never grant

access to the requested protected content. (D.I. 268). Defendants point to the patent abstract, which states that user/subscriber authentication is completed before an operating session occurs. (See *'416 Patent*, Abstract). Defendants note that the patent uses the terms "operating session" interchangeably with the terms "session" and "active session," to discuss something that is not started until after successful authentication. (D.I. 268, pg. 18-19 citing *'416 Patent* 7:48-53, 8:27-30, 10:17-21 and Figs. 17, 18). Finally, Defendants contend that an "operating session" ends when

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[*21] the user logs off or when the website forcibly logs the user off for lack of use. *Id.* at 19:26-37 and Figs 20, 22.

Reviewing the claim language in light of the specification, the Court concludes that "Operating Session" means "a period of communication between the subscriber client computer and the first server computer that follows successful initial authentication and ends upon termination of authorized access, such as upon a log-out or time-out due to prolonged inactivity."

Plaintiff does not contest Defendants' assertion that

"session" and "active session" are used synonymously throughout the specification to refer to what the claim language calls an "operating session." Instead, Plaintiff relies upon Figure 18 to support its position that an operating session begins when identity data is transmitted during a login attempt. (D.I. 207, pg. 19). However, the description of Figure 18 refers to login, authentication and session initiation as three distinct, sequential, phases of a single process. (*416 Patent*, 3:20-22). Moreover, the figure details that a user must input its identity data, which is encrypted before being sent to the login enforcer. The login enforcer then sends

[*22] the encrypted identity data and an "Initiate Session" message to the Session Initiator. (*'416 Patent*, Fig. 18). At this point, with no session yet begun, the Session Initiator sends an "authenticate login" message to the clearinghouse, and the clearinghouse authenticates the login parameters. *Id.* It is only after the user's login parameters are authenticated that the "User Authentication Server" sends a successful "Authentication Response" to the Session Initiator, prompting the Session Initiator to create a new active session with a unique session ID. *Id.* Moreover, the specification states several times, "[i]f the login is

successful, the subscription access server initiates a session[.]" (*'416 Patent*, col 7, ll. 48-53; see also Abstract ("The clearinghouse authenticates the subscriber and server computers before an operating session begins."), col. 5, ll. 21-22 ("A session manager is provided which builds sessions for every valid subscriber"), col. 8 ll. 27-30 ("When the CGIs get the login parameters sent by the subscriber software, they send a request to the session manager to authenticate the subscriber and start a new session."), col. 13, ll. 42-53 and col. 17,

[*23] ll. 45-50). Further, the invention has several features, such as the usage server and the URL tracking server, that are set to track what protected content is visited during an active session, so that information providers can keep a record of how, when, and how often users are accessing the information that has been made available to them. (See e.g. *'416 Patent*, col. 4, ll. 55-59).

Therefore, in light of the process described in Figure 18, the language of the specification, and the described purpose of the operating session, the Court disagrees with Plaintiff that an "operating session" includes the transmission of identity data. Moreover, Plaintiff does not dispute that an operating session ends when a user is no

longer authorized to access protected content. Accordingly, the Court concludes that an operating session follows successful initiation, and ends upon termination of authorized access.

E. Hardware Key and Connected

Claim 1 recites that the invention is comprised of "at least one hardware key connected to the subscriber client computer," and Claims 1 and 24 require that the subscriber client computer "forward [a] predetermined digital identification to

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[*24] [the] first server computer to thereby confirm that [the] hardware key is connected to said subscriber client computer." The parties agree that "hardware key" is used synonymously with the terms "access key" and "hardware access key" in the specification. (D.I. 266 at 27, D.I. 268 at 7). However, they disagree over whether the specification uses the term "connected" interchangeably with "attached."

Plaintiff contends that the hardware key does not need to be an external device, but could also be built into the subscriber client computer. Plaintiff further contends that "connected," as used in the *'416 Patent*, means only

that the access key interface can read the digital ID from the access key. Plaintiff contends that the patent does not require any specific kind of connection between the hardware key and the access key interface.

Defendants contend that a "hardware key connected to the subscriber client computer," as used in the context of the specification, is an external device that physically attaches to the subscriber client computer. (D.I. 268 citing *'416 Patent* at col. 21, ll. 39-45, col. 7, ll. 61). They further argue that Plaintiff's proposed construction, that the hardware

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[*25] key can be built into the computer, would eliminate the need for the invention to verify the presence of the access key.

After reviewing the term "hardware key" in the context of the specification, the Court concludes that the specification requires that the hardware key be an external hardware device. (*'416 Patent*, col. 21, l. 40). The Court declines to adopt Plaintiff's proposal that the key can be built into the computer, because the "major function of the [hardware key] is to uniquely identify a user," and the specification teaches that the key should be something "which is known to have been assigned and given to a specific person." n2 (*Id.*, col. 21, ll. 45-46, col. 22, ll. 4-5). A hardware key built in to a computer is computer-specific, not user-specific.

n2 Plaintiff also supports its argument that the hardware key can be built into the computer by pointing to the following language in the specification: "Generally, two factor authentication provides that something is known,

such as the name and password and something is held, such as the physical key that is attached to the computer, or built into the computer." (D.I. 266 at 28, citing *'416 Patent*, col. 21, ll. 49-53; see also Transcript of Markman Hearing, held November 9, 2006 at Pg. 44, l. 5).

This sentence, however, is a general description of two-factor authentication. As such, the sentence explains to the reader of the patent that two factor authentication is comprised of something which is known and something which is either held or built into the computer. By using the descriptive phrase "such as the physical key that is attached to the computer," in this sentence, the patentee indicated that this invention uses the combination of something held and something known-the physical key attached to the computer that had been referenced throughout the paragraph. (See *id.*, col. 21, l. 37 - col. 22, l. 5).

[*26]

After reviewing the term "connected" in the context of the specification, the Court concludes that it is not synonymous with physical attachment. Though the invention's preferred embodiment involves a hardware key that is physically attached to the subscriber client computer via a port interface, the specification also lists acceptable alternatives to the preferred embodiment which need not be physically attached, including "a credit card, a key, an ATM card, or the like which is known to have been assigned and given to a specific person." (*Id.*, col. 22, ll. 1-5). Therefore, the Court finds that the

specification anticipates hardware keys which are not physically attached.

Moreover, even though the inventors did not describe any embodiment of a hardware key that connects wirelessly to the computer, patent claims are not limited to only those features described in the specification, and later-developed technology is commonly allowed to be covered by broad claim terms. *Varco, L.P. v. Pason Sys. USA Corp.*, 436 F.3d 1368, 1375-76 (*Fed. Cir. 2006*)(citing *Sri Int'l v. Matsushita Elec. Corp. Of Am.*, 775 F.2d 1107, 1121 (*Fed. Cir. 1985*))("The law 'does

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[*27] not require than an applicant describe in his specification every conceivable and possible future embodiment of his invention."")(en banc)). Thus, wireless devices are anticipated by the broad language in the claims and specification. Accordingly, the Court construes "connected" to mean "in communication with, inserted in, or attached to."

F. Predetermined Digital Identification

Plaintiff contends that the "predetermined digital identification" can be known in advance or calculated at the moment it is verified. Conversely, Defendants argue that the "predetermined digital identification" cannot be

calculated at the moment because it must be a unique preassigned data string that cannot be shared with others. (D.I. 268 at 11).

Defendants base their contention on language in the specification calling for the "predetermined digital identification" to be microcoded onto a subscriber's hardware key. (See *'416 Patent*, col. 6, ll. 54-55, col. 14, ll. 52-53). However, the language in Claims 1 and 24 does not require that the hardware key be microcoded with a "predetermined digital identification." Rather, Claim 1 refers to "at least one hardware key being adapted to generate

[*28] a predetermined digital identification," with no specific limitation on when that information is generated. (*'416 Patent*, col. 35, ll. 47-48)(emphasis added). Moreover, Defendants' proposed construction would invalidate dependant claims 6 and 31, which each state that the first server computer can change the predetermined digital identification. (*'416 Patent*, col. 40, ll. 13-15).

In light of these considerations, and guided by the claim and specification language, the Court declines to import the specification limitation of microcoding into the claim language as Defendants' propose. Instead, the Court construes the term "predetermined digital

identification" to mean "digital data whose value is known in advance or calculated at the moment."

G. Subscriber Client Computer

Plaintiff contends that the inventors never intended the "Subscriber Client Computer" to be limited to just a personal computer. Rather, Plaintiff contends, the subscriber client computer encompasses "any programmable electronic device that is capable of running the client software means." (D.I. 207 pg. 21). Plaintiff further contends that the patent covers devices which have been invented since 1997 and

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[*29] that can perform the functions and steps defined in the asserted claims. Defendants contend that because the specification consistently describes the subscriber's computer as a "desktop" or personal computer, Plaintiff's proposed construction is inconsistent with the intrinsic evidence.

After reviewing the term "subscriber client computer" in the context of the specification and other claims, the Court agrees with Defendants, that the "subscriber client computer" described in the *'416 Patent* is not as broad as Plaintiff now proposes. Though nothing in the claim language requires the subscriber client computer to be a desktop computer, every description of the subscriber client computer suggests that it is a desktop personal computer or Macintosh. (*'416 Patent* col. 4, ll. 39-40, col. 5, ll. 35-40, col. 9, ll. 1-3, col. 14, ll. 57-58, 63-66, and Figs. 1 and 2). The repeated disclosure of using a personal computer, and corresponding figures,

limit the "subscriber client computer" to "a computer that a subscriber uses to access selected computer resources of the first server computer." n3

n3 To the extent that Defendants may seek further clarification on the phrase "resources of the first server computer," as used in this construction, the Court would direct the parties to this Memorandum Opinion's earlier construction of "first server computer" and "selected resources of said [at least a] first server computer." The Court's construction of those terms applies here as well, and use of the phrase "resources of the first server computer" in no way suggests that the resources must be stored on the first server computer.

[*30]

H. **"Identity Data"** as it relates to the Subscriber Client Computer and **"Part Of Said Identity Data"**

The parties disagree about what the term "identity data" identifies as it relates to the Subscriber Client Computer, as well as the meaning of the word "part." Thus, the Court must construe each term.

Defendants contend that the "identity data" at issue must uniquely identify the subscriber client computer, not the subscriber, because the claim language refers to identity data "of" the subscriber client computer. After

considering the claim language and the specification, the Court again concludes that Defendants' are restrictively reading the word "of." The term is not limited, as Defendants have argued, to the identity data that uniquely identifies the subscriber client computer. When discussed in the *'416 Patent*, the identity data of the subscriber client computer is that identity data which is transmitted by the subscriber client computer and used by the invention to verify the identity of the subscriber. (See generally *'416 Patent*). Accordingly, the Court construes "Identity Data" as it relates to the Subscriber Client Computer to mean "data sufficient for

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[*31] the patented system to determine whether a person, organization, and/or computer is authentic and/or is entitled to assess said selected computer resources.

The Court will next consider whether "part of said identity data" should be construed to encompass the entirety of the identity data or whether it must refer only to a subset of the identity data. Plaintiff contends that nothing in the *'416 patent* or prosecution history precludes the invention from using only the hardware key's predetermined digital identification to authenticate a user. Plaintiff contends that, when the claims refer to the predetermined digital identification as being "part" of

the identity data, the claims anticipate that the predetermined digital identification could be combined with other information, or could be sufficient on its own, to authenticate a subscriber. The specification, however, reveals that Plaintiff's position is inconsistent with the *'416 Patent*.

The *'416 Patent* discloses that the "identity data" needed to authenticate a subscriber depends upon the type of authentication scheme employed. The patent discloses that there can be one factor or two factor authentication. (*Id.* at col. 1, ll.

[*32] 60-61). When using one factor authentication, the identity data is the subscriber's username and password. Id. When using two-factor authentication, the "identity data" includes the predetermined digital identification from the hardware key. (Id. at col. 1, ll. 61-63). Thus, the patent discloses that to successfully authenticate a subscriber under a one-factor scheme, that subscriber must correctly present a username and password, while successful authentication in a two-factor scheme requires the subscriber to present a username, password and the predetermined digital identification from a hardware key. Moreover, the patent never suggests the hardware key's

predetermined digital identification alone could be enough to authenticate a subscriber. Rather, the specification makes clear that the optional hardware key is only used with two-factor authentication. (Id. at col. 1, ll. 58-67). In those instances where the hardware key is used for authentication, it is always in the context of two-factor identification. (See id. at col. 2, ll. 28-32, col. 3, ll. 45-47, col. 5, ll. 15-18, 50-55, col. 7, ll. 59-65, col. 13, ll. 44-46, col. 14, ll. 48-58, and col. 21, 45-49). Accordingly,

[*33] the Court declines to construe "part of said identity data" as encompassing the entirety of the identity data, and instead construes it to mean "some, but not all, of the identity data of the subscriber client computer."

I. "... to thereby confirm that said [or a] hardware key is connected to said subscriber client computer[.]"

The parties dispute when this phrase calls for the invention to confirm that the hardware key is connected to a subscriber client computer. Defendants propose that it occurs "after initial authentication, but before session termination," or, in other words, during re-authentication

only. Plaintiff contends that the "to thereby confirm" limitations in claims 1 and 24 are broad enough to allow the hardware key's connection to be confirmed during both initial authentication and re-authentication.

As discussed in the preceding section of this Memorandum Opinion, the specification teaches that the "identity data" of the subscriber client computer is comprised of a subscriber's username, password and, in the case of two-factor identification, a hardware key's predetermined digital identification. (Id. at col. 35, ll. 48-50). Per Claims 1 and

[*34] 24, the first server computer is adapted to forward the "identity data" of the subscriber client computer "at the beginning of an operating session." (Id. at col. 35, ll. 36-40). Consistent with the Court's construction of "operating session," once the identity data is confirmed, including confirmation that the hardware key is connected, an operating session begins. It therefore follows that the claim limitations requiring forwarding of the predetermined digital identification during an operating session do not read on initial authentication.

The '416 Patent describes that the invention initially authenticates subscribers, and then re-authenticates them

throughout the operating session. Initial authentication occurs at login, and results in initiating an operating session. Re-authentication occurs after initial authentication but before the operating session terminates. Therefore, pursuant to the patent language and teachings, the phrase "to thereby confirm that said hardware key is connected to said subscriber client computer" only applies to the system's efforts to confirm that the hardware key is attached during re-authentication. Accordingly, the Court construes this phrase

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[*35] to mean "to verify after initial authentication, but before session termination, that the hardware key remains connected to the subscriber client computer."

J. Permit[ing] access

Defendants have urged the Court to construe "permit[ing] access" as meaning "authorizing the use of," which they contend reflects the term's ordinary meaning in light of the specification. However, Defendants have not presented sufficient evidence to warrant departing from the claim language in favor of a synonym. Accordingly the court will construe "permit[ing] access" to mean "permitting the subscriber client computer to access said selected computer resources."

K. Client Software Means

The parties agree that "Client Software Means" is a means-plus-function element construed pursuant to 35 U.S.C. § 112, P. 6. (D.I. 207, at 7). They disagree, however, about the scope of the function and the corresponding structure.

1. Scope of the Function

Under *Section 112*, P 6, the Court must first determine what function is performed by the claim element. In making this determination, the Court must be careful to neither "narrow the scope of the function beyond

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[*36] the claim language" nor "broaden the scope of the claimed function by ignoring clear limitations in the claim language." *Cardiac Pacemakers, Inc. v. St. Jude Med., Inc.*, 296 F.3d 1106, 1113 (Fed. Cir. 2002). The parties disagree about two different parts of this element's functional scope. First, they disagree as to whether the language "adapted to" is part of the function. Second, they disagree about whether the function should be temporally limited.

As to the first dispute, Plaintiff contends that, by including the language "adapted to," the claim demands only a capability, not a requirement, to forward a

subscriber client computer's identity data to a first server computer. (D.I. 266 at 12). Defendants contend that the "adapted to" language should be read out of the function, just as the word "for" would be in a conventional means-plus-function clause. (D.I. 306 at 2-3). The result of Defendants' proposed construction would be to require the client software means to forward a subscriber client computer's identity data to said first server computer. *Id.*

As to the second dispute, Plaintiff contends that the functional recitation is not temporally limited. While

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[*37] acknowledging that this element's language includes the phrase "at the beginning of an operating session in which access to selected computer resources is requested[.]" Plaintiff contends that this language is not a functional limitation of the element, and, therefore, should be subject to traditional claim construction principles rather than means-plus-function construction. (D.I. 266 at 7). Conversely, Defendants contend that the function must include the temporal limitations of the claim language to avoid improperly broadening the scope of the claimed function. (D.I. 266 at 30-32). They contend that the claimed function for "Client Software

Means" is not forwarding the identity data at any time, but rather, forwarding the identity data at a particular time. *Id.*

Often means-plus-function limitations are written as a "means for" performing a recited function. See *Lucent Techs., Inc. v. Extreme Networks, Inc.*, 367 F. Supp. 2d 649, 669 (D. Del. 2005). Here, the applicants used the formulation "means adapted to" perform a recited function. The issue before the Court, then, is whether "adapted to" merely precedes the claimed function or whether it is a part of

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[*38] the claimed function. The Court agrees with Plaintiff that ignoring the "adapted to" language introduces an unintended requirement into the claim element, because the claim language only discloses a capability. See *Berg Tech., Inc. v. Foxconn Int'l, Inc.*, 1999 U.S. App. LEXIS 2796, at *8 (Fed. Cir. 1999) ("adapted to" is commonly understood to mean "capable of"). Therefore, the "adapted to" language does more than precede the recited function; it is a part of the recited function.

A means-plus-function clause does not limit all terms

in the clause to what is disclosed in the patent or equivalents. "[Section] 112, P 6 applies only to interpretation of the means or step that performs a recited function when a claim recites insufficient structure or acts for performing the function." *IMS Tech., Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 1432 (Fed. Cir. 2000). In this case, the client software means is "adapted to forward the subscriber client computer's identity data to said first server computer at the beginning of an operating session in which access to selected computer resources is required." (See '416 Patent, col. 256, line 42-45). The

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[*39] beginning of an operating session, however, is not the means or step for performing the data forwarding, and therefore, is not subject to *Section 112*, P 6. Accordingly, the Court concludes that while "client software means" is a means-plus-function element, the means-plus-function interpretation does not apply to the phrase "at the beginning of an operation session in which access to selected computer resources is requested[.]"

Thus, the function performed is "adapted to forward a subscriber client computer's identity data to said first server computer." "At the beginning of an operating session in which access to selected computer resources is

requested[.]" is not construed pursuant to 35 U.S.C. § 112, P 6, and is instead construed in accordance with the Court's previous construction of "operating session."

2. Corresponding Structure

Second, the Court must determine what structure corresponds to the claimed function. The parties disagree about the structure of the client software means, and the algorithm to be performed by that structure. n4 The Court finds that the '416 Patent specification links the claimed function of the client software means

[*40] to software products that were available at the time of the patent application. ('416 Patent at 5:48-50, 56-63). Therefore, the structure is that software identified in the specification that can carry out the function, namely "that portion of the identity and access components (e.g. that portion of the subscriber software running on the subscriber client computer (Fig. 2)) that preferably uses the transmission control protocol/internet protocol (TCP/IP) and/or user datagram protocol/internet protocol (UDP/IP) to communicate with the first server computer and equivalents there of." (contra *McKesson Info. Solutions LLC v. TriZetto Group, Inc.*, 2006 U.S. Dist. LEXIS 16097, at *9 (D. Del. 2006)(structure limited

to disclosed algorithm only because specification linked to software that did not exist at time of patenting).

n4 The Court declines to define the exact algorithm disclosed in the specification, but notes that the client software means structure is limited to carrying out the algorithms described in the '416 patent. See *WMS Gaming Inc. v. International Game Tech.*, 184 F.3d 1339 (Fed. Cir. 1999).

[*41]

L. Server Software Means

The parties agree that this claim element is a means-plus-function limitation governed by 35 U.S.C. § 112, P 6. The parties also agree that the element has two corresponding functions and structures. Consistent with its construction of "adapted to" and "at the beginning of an operating session in which access to selected computer resources of said first server computer is requested," the Court construes this claim element as follows:

1. First Function and Corresponding Structure

The first function is "adapted to forward the first

server computer's identity data and identity data of each subscriber client computer to said clearinghouse means." The corresponding structure is "that portion of the identity and access management components (e.g. software running on the server 34 (Fig. 2)) that preferably uses the transmission control protocol/internet protocol (TCP/IP) and/or user datagram protocol/internet protocol (UDP/IP) to communicate with the subscriber client computer and the clearinghouse 30 (Fig. 2), and equivalents thereof."

2. Second Function and Corresponding Structure

The second function is "adapted to

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[*42] selectively request the subscriber client computer to forward said predetermined digital identification to the first server computer to thereby confirm that said hardware key is connected to said subscriber client computer." The corresponding structure is "that portion of the server software that selectively determines whether (e.g. upon a request for access to protected computer resources) to request the subscriber client computer to forward its digital identification to the first server computer to confirm the presence of a hardware key, and equivalents thereof."

M. "Clearinghouse Means" In Claim 1

The parties agree that this claim element, as it appears in Claim 1, is governed by 35 U.S.C. § 112, P 6. They also agree that four distinct functions are performed by the clearinghouse means, though they disagree over what those functions and corresponding structures are. The Court adopts the following constructions, consistent with its discussion about the language "adapted to" and the necessity of temporal limitations in the "client software means" subsection.

1. First Function and Corresponding Structure

The first function is "storing identity

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[*43] data of said first server computer and the identity data of each of said subscriber client computers." The corresponding structure is "a processor programmed to store the identity data of the first server computer and identity data of the subscriber client computer in a structured query language (SQL) database using an open database connectivity (ODBC) driver."

Section 112, P 6 allows patentees to express a limitation in their patent claims "as a means or a step for performing a specified function without the recital or structure . . . in support thereof." 35 U.S.C. § 112, P 6. Plaintiff chose to employ this section when describing the

"clearinghouse means" in Claim 1, resulting in a means-plus-function limitation. However, a consequence of choice is that scope of the means-plus-function limitation is limited to the "corresponding structure described in the specification and equivalents thereof." *Genzyme Corp. v. Atrium Med. Corp.*, 212 F. Supp. 2d 292, 302 (D. Del. 2002) (citing *J&M Corp. v. Harley Davidson, Inc.*, 269 F.3d 1360, 1367 (Fed. Cir. 2001)).

Plaintiff proposes that the corresponding structure to this first function

[*44] is "any clearinghouse server(s) with the software capable of storing identity data and equivalents thereof." This construction, however, is much broader than the structure described in the specification. The specification describes a structured language query (SQL) database that can collect and store the identity data of the first server computer and subscriber client computers. (416 *Patent* at Figs. 1, 3, and 4, col. 2, ll. 3-4, col. 4, ll. 50-52, and col. 6, ll. 61-65). It also describes that an open database connectivity (ODBC) driver is used so the clearinghouse means can communicate with other components of the invention. *Id.* Accordingly, the Court agrees with Defendants that the corresponding structure

for the first function is "processor(s) programmed to store the identity data of the first server computer and identity data of the subscriber client computer in a structured query language (SQL) database using an open database connectivity (ODBC) driver."

2. Second Function and Corresponding Structure

The second function is "adapted to authenticate the identity of said subscriber client computer." The corresponding structure is "that portion of the clearinghouse software

[*45] (e.g. a user authentication daemon 58) which authenticates the subscriber client computer, and equivalents thereof."

3. Third Function and Corresponding Structure

The third function is "adapted to authenticate the identity of said first server computer." The corresponding structure is "that portion of the clearinghouse software (e.g. a user authentication daemon 58) which authenticates the first server, and equivalents thereof.

4. Fourth Function and Corresponding Structure

The fourth function is "adapted to permit access to said selected computer resources." The corresponding

structure is "that portion of the clearinghouse software which authenticates the first server and equivalents thereof.

N. "Clearinghouse Means" in Claim 24

The parties disagree about the applicability of 35 U.S.C. § 112, P 6 to "clearinghouse means" as used in Claim 24. Defendants contend that the patentee's use of the word "means" clearly signals that the patentee intended this to be a means-plus-function clause. Under this theory, the word "means" gives rise to the presumption that *Section 112*, P 6 applies to the claim element. Defendants further contend that Plaintiff

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[*46] cannot overcome this presumption, because the claim does not recite a function that corresponds with the clearinghouse means or a sufficiently definite structure for performing the function. Therefore, Defendants contend, *Section 112*, P 6 applies to the claim element. Plaintiff contends that Claim 24 is a step-plus-function claim, not a means-plus-function claim, and under step-plus-function construction rules, *Section 112*, P 6 is not presumed to apply.

The first question the Court must answer is whether Claim 24 invokes a means-plus-function limitation or a step-plus-function limitation, or neither. When

interpreting *section 112*, P 6, "structure" and "material" are associated with means-plus-function claims, whereas "acts" or "steps" are associated with step-plus-function claim elements. *Seal-Flex*, 172 F.3d at 843 (*Fed. Cir. 1999*)(citing *O.I. Corp. v. Tekmar Co. Inc.*, 115 F.3d 1576, 1583 (*Fed. Cir. 1997*)).

Because Claim 24 claims "[a] method of controlling access . . . comprising the steps of [the claimed elements, including clearinghouse means]," n5 the Court is not persuaded by Defendants' argument that the mere presence of the word "means"

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[*47] makes this claim element a means-plus-function element. Instead, the Court agrees with Plaintiff that Claim 24 is a method claim, and considers the term "clearinghouse means" in Claim 24 to be little more than an "overzealous use" of the word means. See *Genzyme*, 212 F. Supp. 2d at 310 n. 10 (D. Del. 2002). In light of this determination, Section 112, P 6 could apply to this claim term only under the step-plus-function analysis.

n5 Contrast this language with that of Claim 1, which claims "[a] system for controlling the operation of and access . . . comprising [the

claimed elements.]" (416 Patent at Col. 35 ll. 25-30)

The second question the Court must answer is whether Claim 24 is written in step-plus-function format so as to invoke Section 112, P 6. Generally, if a claim element includes the words "step for," it is presumed to be a step-plus-function limitation, and Section 112, P 6 is presumed to apply. However, when the claim uses the word "step" alone, or "steps of," then Section 112, P 6 is presumed

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[*48] not to apply to that element. *St. Clair Intellectual Prop. Consultants, Inc. v. Canon Inc.*, 2004 U.S. Dist. LEXIS 17489 at *78 (citing *Seal-Flex*, 172 F.3d at 849 (Fed. Cir. 1999)).

The first limitation of Claim 24 describes the step of "registering identity data . . . in a clearinghouse means[.]" ('416 Patent at col. 38, ll. 42-46). The second limitation of Claim 24 describes the step of "requiring a subscriber client computer to forward its identity data to said clearinghouse means[.]" (Id. at ll. 47-50). The fourth and fifth limitations of Claim 24 describe the steps of "attempting to authenticate the identity data [of a

subscriber client computer and first server computer] . . . from said clearinghouse means[.]" (Id. at ll. 56-63). The Court concludes that none of these elements are written in step-plus-function format, because, (1) the language "step for" is not used, and (2) the limitations individually describe the precise acts required to control access to selected computer resources. Thus, *Section 112*, P 6 does not apply to the term "clearinghouse means" as used in Claim 24.

Having concluded that the use of the term "clearinghouse

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[*49] means" in Claim 24 invokes neither a means-plus-function limitation or step-plus function limitation, and therefore, concluding that *Section 112*, P 6 does not apply, the Court adopts Plaintiff's proposed construction of "clearinghouse means" in Claim 24. Accordingly, "clearinghouse means" is construed to mean "any clearinghouse server(s) with software capable of storing and authenticating identity data."

V. Conclusion

For the reasons discussed, the Court has denied Plaintiff's Motion For Leave To Supplement The Markman Hearing Record (D.I. 376) and construed the disputed terms and phrases of the patent-in-suit as provided herein. An Order consistent with this Memorandum Opinion will be entered setting forth the

meaning of the disputed phrases in the patent-in-suit, and denying Plaintiff's Motion.

ORDER

At Wilmington, this 2 day of April 2007, for the reasons set forth in the Memorandum Opinion issued this date,

IT IS HEREBY ORDERED that:

1. Plaintiff's Motion For Leave To Supplement The Markman Hearing Record is **DENIED**.
2. For the purposes of *United States Patent No. 6,516,416*, the following terms and phrases are construed as follows:

[*50]

a. **"Untrusted Network"** is construed to mean "a public network with no controlling organization, with the path to access the network being undefined and the user being anonymous."

b. **"Subscriber"** is construed to mean "a person, organization, or computer registered to be allowed access to selected computer resources."

c. **"First Server Computer"** is construed to mean "a computer that makes available information or other resources."

d. **"Selected Computer Resources of at least a [or said] first server computer"** is construed to mean "computer services,

applications, or content that can be accessed by (either directly or indirectly) said first server computer."

e. **"Operating Session"** is construed to mean "a period of communication between the subscriber client computer and the first server computer that follows successful initial authentication and ends upon termination of authorized access, such as upon a log-out or time-out due to prolonged inactivity."

f. **"Hardware Key"** is construed to mean "external hardware device or object from which the predetermined digital identification can be read."

g. **"Connected"**

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[*51] is construed to mean "in communication with, inserted in, or attached to."

h. **"Predetermined Digital Identification"** is construed to mean "digital data whose value is known in advance or calculated at the moment."

i. **"Subscriber Client Computer"** is construed to mean "a computer that a subscriber uses to access selected computer resources of the first server computer."

j. **"Identity Data"** as it relates to the **Subscriber Client Computer** is construed to mean "data sufficient for the patented system to determine whether a person, organization, and/or computer is authentic and/or is entitled to assess said

selected computer resources."

k. **"Part Of Said Identity Data"** is construed to mean "some, but not all, of the identity data of the subscriber client computer."

l. **"To thereby confirm that said [or a] hardware key is connected to said subscriber client computer"** is construed to mean "to verify after initial authentication, but before session termination, that the hardware key remains connected to the subscriber client computer."

m. **"Permit[ing] Access"** is construed to mean "permitting the subscriber client computer to access

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[*52] said selected computer resources."

n. **Client Software Means** is a means plus function element construed pursuant to 35 U.S.C. § 112, P 6. The claimed function is "adapted to forward the subscriber client computer's identity data to said first server computer." The corresponding structure consists of that portion of the identity and access components (e.g. that portion of the subscriber software running on the subscriber client computer (Fig. 2)) that preferably uses the transmission control protocol/internet protocol (TCP/IP) and/or user datagram protocol/internet protocol (UDP/IP) to communicate. The term "at the beginning of an operating session in

which access to selected computer resources is requested" is not construed pursuant to 35 U.S.C., § 112, P 6, and is construed consistent with the meaning of "operating session."

o. **"Server Software Means"** is a means plus function element construed pursuant to 35 U.S.C. § 112, P 6. It has two distinct functions and corresponding structures.

1. The first claimed function is "adapted to forward the first server computer's identity data and identity

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["53] data of each subscriber client computer to said clearinghouse means." The first corresponding structure is processor(s) programmed to store the identity data of the first server computer and identity data of the subscriber client computer in a structured query language (SQL) database using an open database connectivity (ODBC) driver."

2. The second claimed function is "adapted to selectively request the subscriber client computer to forward said predetermined digital identification to the first server computer to thereby confirm that said hardware key is connected to said

subscriber client computer." The corresponding structure is "that portion of the server software that selectively determines whether (e.g. upon a request for access to protected computer resources) to request the subscriber client computer to forward its digital identification to the first server computer to confirm the presence of a hardware key, and equivalents thereof."

p. "Clearinghouse Means" as used in Claim 1 is a means plus function element construed pursuant to 35 U.S.C. § 112, P 6. It has four distinct functions and corresponding structures.

1. The first

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[*54] claimed function is "storing identity data of said first server computer and the identity data of each of said subscriber client computers." The corresponding structure is "a processor programmed to store the identity data of the first server computer in a structured query language (SQL) database using an open database connectivity (ODBC) driver."

2. The second claimed function is "adapted to authenticate the identity of said first server computer." The corresponding structure is "that portion of the clearinghouse software (e.g. a user authentication daemon 58) which authenticates the subscriber client computer, and equivalents thereof."

3. The third claimed function is "adapted to authenticate the identity of said first server computer." The corresponding structure is "that portion of the clearinghouse software (e.g. a user authentication daemon 58) which authenticates the first server, and equivalents thereof."

4. The fourth function is "adapted to permit access to said selected computer resources." The corresponding structure is "that portion of the clearinghouse software which authenticates the first server and equivalents thereof."

q. "Clearinghouse Means"

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[*55] as used in Claim 24 is not a means plus function element construed pursuant to 35 U.S.C. § 112, P 6. It is construed to mean "any clearinghouse server(s) with software capable of storing and authenticating identity data."

r. "Authenticate" is construed to mean "determine that something is, in fact, what it purports to be."

s. "Adapted to forward" is construed to mean "capable of transmitting."

t. "Requiring . . . to forward" is

construed to mean "requiring that certain information be transmitted."

u. "It's" in the context of "its identity data" is construed to refer to the identity data of a first server computer as the term appears in Column 35, line 36 of the '416 Patent, and is also construed to refer to the identity data of a subscriber client computer as the term appears in Column 35, line 42.

Joseph Farnan

UNITED STATES DISTRICT JUDGE

EXHIBIT 19

LEXSEE 2004 U.S. DIST. LEXIS 8958



Caution

As of: Apr 13, 2007

**BOROUGH OF OLYPHANT, PENNSYLVANIA Plaintiff, v. PP&L, INC., PPL
CORP., PPL ELECTRIC UTILITIES CORP., and PPL GENERATION, L.L.C.,
Defendants.**

CIVIL ACTION, NO. 03-4023

**UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT OF
PENNSYLVANIA**

2004 U.S. Dist. LEXIS 8958

May 14, 2004, Filed; May 14, 2004, Entered

SUBSEQUENT HISTORY: Summary judgment granted, in part, summary judgment denied, in part by *Borough of Olyphant v. PP&L, Inc.*, 2004 U.S. Dist. LEXIS 16684 (E.D. Pa., Aug. 19, 2004) Affirmed by *Borough of Olyphant v. PPL Corp.*, 2005 U.S. App. LEXIS 22884 (3d Cir. Pa., Oct. 20, 2005)

DISPOSITION: Defendants' motion for summary judgment granted. Judgment entered for Defendants.

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For WEA MANUFACTURING, INC., DYNAMIC MOLDING, INC., UNITED FENCE SUPPLY COMPANY, INC., A.L.S. SERVICES, INC., PEDMAR, INCORPORATED, SIMPLEXGRINNELL, LP, RIST CONSTRUCTION INC., DESAVINO & SONS, INC., MICHAEL WASHO CONSTRUCTION CO. INC., d/b/a P&W / Washo, Inc., CAINES MECHANICAL CONTRACTORS, INC., Intervenor Defendants: KIMBERLY M. COLONNA, MCNEES WALLACE & NURICK, HARRISBURG, PA.

For PENNSYLVANIA POWER & LIGHT COMPANY, PPL CORPORATION, PPL ELECTRIC UTILITIES CORPORATION, PPL GENERATION,

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[*2] LLC, Counter Claimants: EDWARD H. RIPPEY, JAMES R. ATWOOD, COVINGTON & BURLING, WASHINGTON, DC. GLEN R. STUART, MORGAN, LEWIS & BOCKIUS, PHILADELPHIA, PA.

For BOROUGH OF OLYPHANT, Counter Defendant: C.J. MUSTACCHIO, SCRANTON, PA. CHARLES F. WHEATLEY, JR., WHEATLEY & RANQUIST PA, ANNAPOLIS, MD.

JUDGES: William H. Yohn, Jr., Judge.

OPINION BY: William H. Yohn, Jr.

OPINION:

MEMORANDUM and ORDER

YOHN, J.

May 14, 2004

The Borough of Olyphant, Pennsylvania ("the Borough") brings this action against PP&L, Inc., PPL

Corp., PPL Electric Utilities Corp., and PPL Generation, L.L.C. (collectively, "PPL") alleging various antitrust violations, Compl. PP 12-18, 22, and asserting a claim for breach of contract and/or violation of final orders of the Federal Energy Regulatory Commission ("FERC"). n1 Compl. PP 19-22. Defendants assert counterclaims for tortious interference with ongoing contractual relations, Counterclaims PP 8-11, 18-29, and breach of contract. Counterclaims PP 12-17, 30-35. Currently pending before the court is defendants' second motion for summary judgment on all counts of plaintiff's complaint.

n1 Plaintiff has characterized its claim contained in Count II of the complaint alternatively as a claim for breach of contract and a claim for violation of FERC final orders. I address this ambiguity in Part II of this opinion, but ultimately conclude that the characterization is, in fact, inconsequential to the determination of whether or not plaintiff's claim survives summary judgment.

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Defendants argued in their first motion for summary judgment n2 that they are entitled to summary judgment on all claims contained in count I, i.e. all allegations of antitrust violations, because the Borough cannot show "antitrust injury." n3 "Antitrust injury" has been defined by the Supreme Court as: "injury of the type the antitrust laws were intended to prevent and that flows from that which makes defendants' acts unlawful. The injury should reflect the anticompetitive effect either of the violation or of anticompetitive acts made possible by the violation." *Brunswick Corp. v. Pueblo Bowl-O-Mat, Inc.*, 429 U.S. 477, 489, 50 L. Ed. 2d 701, 97 S. Ct. 690 (1977).

n2 The first motion for summary judgment was dismissed as moot by order of March 24, 2004 since the second motion for summary judgment incorporated the same arguments.

n3 Although defendants renew this argument in their second motion for summary judgment, they do so summarily, without any additional evidence or legal support. Therefore, even though defendants' first motion for summary judgment has been dismissed, I will refer to it for the analysis of defendants' "antitrust injury" argument.

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Defendants contend that "the Borough seeks exclusive rights to serve power to customers within its borders and does not seek competition," Def. Br. in Support of First Mot. for Summ. J 6, and that, therefore, plaintiff cannot show antitrust injury. However, a number of plaintiff's claims relate to the wholesale power market, see Parts I.A and I.C.2 of this opinion, in which PPL is a seller and the Borough is a buyer, and not the retail power market, in which both PPL and the Borough are sellers. Defendants' arguments regarding what the Borough plans to do as a seller of retail power do not affect the

Borough's status and interest as a buyer of wholesale power. Hence, regardless of any expressed interest by the Borough to become the sole retail energy provider to customers within its borders (which may or may not be realized), the Borough has alleged a sufficient "antitrust injury" as a buyer of wholesale power. n4 And since the Borough has joined other boroughs in Pennsylvania to essentially reassert in a new action all of the claims presently before this court, see *Borough of Lansdale v. PP&L, Inc.*, No. 02-8012 (E.D. Pa. filed Oct. 22, 2002), it seems more efficient to address

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[*5] and rule on all of the legal arguments (and facts presented in support thereof) than to consider some of these issues in the instant case and some in the *Lansdale* case. n5 This is particularly true considering the unlikelihood that all of the other boroughs in the *Lansdale* case have expressed the same (alleged) desire to become the sole retail energy provider for the customers within their respective borders. Hence, I will not further address the arguments raised in defendants' first motion for summary judgment and reiterated in defendants' second motion for summary judgment concerning the lack of "antitrust injury."

n4 Defendants conceded at oral argument that they had not briefed the "lack of antitrust injury"

argument as it may apply to wholesale energy sales.

n5 For the same reason, I will not consider defendants argument that if summary judgment is granted on the claims contained in the first count of plaintiff's complaint, the Court does not have jurisdiction over the claims contained in the second count of the complaint because supplemental jurisdiction would be lost. Rather, I will address and rule on all of the legal arguments and facts presented in support of the claims contained in the second count of the complaint.

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For the reasons set forth below; defendants' motion for summary judgment will be granted. More specifically, I will grant defendants' motion for summary judgment on plaintiff's claims for violation of § 1 of the *Sherman Act*, § 2 of the *Sherman Act* via a price squeeze, and § 2 of the *Clayton Act*, as well as plaintiff's claim for breach of contract and/or violation of final orders of the FERC. I will grant defendants' motion for summary judgment on plaintiff's claim that defendants monopolized or attempted to monopolize the wholesale power market in violation of § 2 of the *Sherman Act*, but without prejudice to the right of plaintiff to pursue the claim in the

Lansdale case. Since defendants succeed on their motion for summary judgment in its entirety for other reasons, it is unnecessary to consider defendants' statute of limitations argument at this time. Def. Br. 18-19.

BACKGROUND

This case involves the electric power industry in Pennsylvania. This industry is partially regulated by the Federal Energy Regulatory Commission ("the FERC"), partially regulated by the Pennsylvania Public Utility Commission ("the PUC"), and partially unregulated. In general, the FERC regulates

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[*7] the sale of wholesale power and its transmission in interstate commerce and the PUC regulates the sale of retail power in Pennsylvania and its distribution to the ultimate consumer. In the instant case, the two regulatory regimes are often considered simultaneously, primarily because the Borough purchases wholesale power from PPL for resale to its retail customers and also competes with PPL for the sale of retail power to other potential retail customers. It is important, however, to understand the basics of how each regime works independently in order to be able to understand how the two interact in the instant case.

I. The PUC and Retail Power in Pennsylvania

Effective January 1, 1997, Pennsylvania adopted the Electricity Generation Customer Choice and Competition Act ("Competition Act"), *66 Pa. Cons. Stat. §§ 2801 et seq.*, which effectively deregulates the business of generating electricity in Pennsylvania. Consumers can now choose to purchase their electricity from electric generation suppliers ("EGS") other than the utility previously granted an exclusive franchise. Generation service, however, is only one of three services traditionally

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[*8] provided by the sole utility granted an exclusive franchise over any individual territory. *PP&L Industrial Customer Alliance v. Pennsylvania Public Utility Comm'n*, 780 A.2d 773 (Pa. Cmwlth. 2001). The other two services are transmission and distribution. *Id.* These two services, which are considered "natural monopolies," were not opened to competition by the Competition Act, but rather continue to be regulated. The local utility still remains solely responsible for the transmission and distribution of the electricity. If consumers do not or cannot choose an alternative EGS, the local utility is also required to provide electricity to them as the "provider of

last resort" ("POLR") at the rate cap amount. 66 PA. CONS. STAT. § 2802(16). Those consumers who do choose another generation supplier receive a "shopping credit" from the local utility, which is equal to the generation component of the bundled rate. These consumers then pay the market rate (usually lower than the local utility rate) to a different EGS for the generation of their electricity, while continuing to pay the local utility its rates for transmission and distribution.

The

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[*9] Pennsylvania Legislature recognized that certain costs incurred by local utilities while they were monopolies (and the electricity market was completely regulated) would not be recoverable in a competitive market. *See 66 PA. CONS. STAT. § 2803*. These are referred to as "stranded costs." In order to allow the local utility to recover its stranded costs, the General Assembly created the competitive transition cost ("CTC"), *66 PA. CONS. STAT. § 2808*, which would be paid by retail consumers to their local utility, i.e. the former monopoly in the area that remains responsible for the distribution of the electricity. The Competition Act required each Pennsylvania utility to file a "restructuring" plan with the PUC, *66 PA. CONS. STAT. § 2806(d)*, which needed to

explain how the utility would come into compliance with the new mandates of the Competition Act. In addition to reviewing all of the restructuring plans, the Competition Act also assigned the PUC the responsibility of determining each utility's retail stranded costs, which it would do after a public proceeding. n6

n6 The stranded costs allocated to retail distribution lines are regulated by the PUC. As will be seen, stranded costs allocated to wholesale transmission lines are regulated by the FERC.

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II. The FERC and Wholesale Power in Pennsylvania

In 1935, Congress enacted the Federal Power Act ("FPA"), 16 U.S.C. §§ 791a-828c, which "established the Federal Power Commission to oversee the wholesale transmission and sale of interstate electric power." 49 Stat. 838 (1935) (codified as amended at 16 U.S.C. §§ 791a-825r). n7 In 1996, the FERC issued Order No. 888 in an effort to remedy certain perceived defects in the bulk power markets. *New York v. FERC*, 535 U.S. 1, 11, 152 L. Ed. 2d 47, 122 S. Ct. 1012 (2002) (interpreting

Order No. 888, 75 FERC 61,080). The portion of this Order relevant to the instant case is that it required, like the Pennsylvania Competition Act to follow, the unbundling of generation and transmission services. As the Supreme Court explained this provision, the unbundling "required each utility to state separate rates for its wholesale generation, transmission, and ancillary services, and to take transmission of its own wholesale sales and purchases under a single general tariff applicable equally to itself and to others." *New York*, 535 U.S. at 11. This effectively opened

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[*11] the potential for competition among energy wholesalers because a consumer could now purchase energy from an alternative supplier and have that energy transmitted over the network already in place. And like the Pennsylvania General Assembly, it permitted the previously monopolistic wholesalers to recover reasonable wholesale stranded costs incurred because of the increased competition for generation services.

n7 In 1997, Congress reorganized the FPC as FERC.

In order to regulate the price of wholesale power, the FERC traditionally required "every public utility [to] file with the Commission . . . schedules showing all rates and charges for any transmission or sale subject to the jurisdiction of the Commission," 16 U.S.C. § 824d(a), i.e. the "transmission of electric energy in interstate commerce" and "sale of electric energy at wholesale in interstate commerce." 16 U.S.C. § 824(b). However:

more recently, in the case of wholesale electricity, FERC has

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[*12] moved to a rate-based market mechanism for pricing electricity. In other words, rates are determined based upon the price obtained when electricity is traded on the market. These rates paid by wholesale buyers remain subject to FERC jurisdiction and review. While utilities do not necessarily file specific rates with FERC prior to selling energy, they sell pursuant to the terms, conditions and formulas established by FERC's regional wholesale electricity rules. FERC approves those rules in advance of authorizing the wholesale electricity markets to operate.

Utilimax.com, Inc. v. PPL Energy Plus, LLC, 273 F. Supp. 2d 573, 575-76 (E.D. Pa. 2003). The relevant regional wholesale electricity market established by the FERC is PJM Interconnection ("PJM"). "Pursuant to rules approved by FERC and subject to FERC's on-going regulation of wholesale electricity markets, PJM coordinates the continuous buying, selling, and delivery of wholesale electricity through various auction markets designed to match supply with demand." *Id.* at 576. Many wholesale customers purchase the energy they ultimately resell at retail to end-users through what is called the

[*13] "installed capacity" ("ICAP") market. n8 Wholesale customers can buy their necessary power "by any of three methods: (a) acquiring capacity through bilateral contracts with other entities; (b) purchasing capacity credits in the PJM long-term auction market; or (c) purchasing capacity credits in the PJM daily auction market." *Id.* The FERC regulates each of these purchasing methods.

n8 The specifics of installed capacity and how the ICAP market works are not important at this juncture and will therefore not be discussed.

III. The Facts of the Instant Case

The Borough of Olyphant is a municipal corporation organized and existing under the laws of the Commonwealth of Pennsylvania. Def. Statement of Facts P1. PPL Corporation is the parent holding company of PPL Electric Utilities Corporation and PPL Generation, L.L.C., which means these two entities are wholly owned subsidiaries of PPL Corporation. *Id.* Prior to a corporate realignment completed in 2000, PPL Electric Utilities Corporation was named

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[*14] PP&L, Inc. *Id.* at P2. PPL Electric Utilities Corporation is engaged in electricity generation and markets and trades wholesale electricity, capacity, and other related products. *Id.* PPL Electric Utilities Corporation is also a regulated public utility engaged in electric delivery service and electric supply to retail customers in its service territory in Pennsylvania. *Id.* The Borough presently purchases 12 kV power at wholesale from PPL and distributes and resells that power to most residents within its borders. Pl. Statement of Facts P 3. Thus, PPL does not provide retail energy directly to these Borough residents. Def. Statement of Facts P5. Located

almost entirely within the borders of the Borough, however, is the Mid-Valley Industrial Park ("the Park"). *Id.* at P 3. PPL sells electricity directly, i.e. retail, to the Park residents, who do not resell the electricity they purchase from PPL. *Id.* Two Park customers have exercised their right to take electricity from alternate suppliers. *Id.* at P 9.

Pursuant to the Pennsylvania Competition Act, PPL submitted its restructuring plan to the PUC on April 1, 1997, which included, *inter alia*, proposed unbundled

[*15] rates, CTCs and tariff provisions, as well as a proposed stranded cost calculation. Pl. Ex. 5 (Joint Petition to PUC) at 6. After significant debate before the PUC between PPL and thirty-six intervening parties regarding the terms of the plan, the PUC adopted an opinion and order which substantially modified PPL's restructuring plan. *Id.* at 8. It seems neither side was satisfied with the PUC's revisions, as a number of parties filed suit in either a United States District Court or Pennsylvania Commonwealth Court. *Id.* at 9. The parties, however, eventually reached an agreement, the terms of which were put into a Joint Petition for Full Settlement of

PP&L, Inc.'s Restructuring Plan and Related Court Proceedings ("Joint Petition"), Pl. Ex. 5, and presented to the PUC for approval. The PUC approved the terms in a Final Order on August 27, 1998, which included an overall rate decrease and an increase in the amount of retail stranded costs PPL would be permitted to recover. Def. Ex. U. This order governs the sale of power by PPL to any retail consumer in Pennsylvania, including the Park customers within the Borough.

On May 8, 1996, after the FERC issued Order No. 888, a number of

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[*16] Pennsylvania Boroughs, including Olyphant, filed a proceeding before the FERC "to determine their liability, if any, to PP&L for 'stranded costs' if they were to stop purchasing capacity and energy from PP&L following the initial 5-year terms of their current agreements with PP&L." Def. Ex. N (FERC Settlement Agreement) at Art. 1. On January 29, 1998, PPL and the Boroughs reached a settlement, which they put in writing and submitted to the FERC for approval. Def. Ex. O (Power Supply Agreement) at Art. 1. The agreement resolved the stranded cost issues between the parties at that time (PPL would not seek stranded costs from the Boroughs) n9 and modified their current power supply agreements. Def. Ex. N (FERC Settlement Agreement) at Art. 1. The FERC approved this settlement on May 29, 1998. Def. Ex. R. As part of the settlement agreement,

PPL and the Borough entered into a new, five year power supply agreement on December 8, 1998. Def. Ex. O. Under the agreement, the Borough pays neither wholesale nor retail stranded costs on the wholesale power it purchases.

n9 The precise meaning of this agreement is at issue in the instant case. More specifically, exactly which stranded costs, i.e. wholesale (transmission) or retail (distribution), PPL forfeited the right to collect from the Borough, is a central issue in the resolution of the Borough's claims.

[*17]

The Borough seeks to be the electricity provider for all Park customers. Pl. Statement of Facts § 5. The Park customers currently do not pay wholesale stranded costs but do pay retail stranded costs. If the Borough is successful, the defendants argue the Park customers will still not pay wholesale stranded costs, but defendants will seek to continue to collect retail stranded costs. The Borough objects to this contention. At oral argument the parties advised the court that the PUC had agreed with the defendants' position but that the matter was still on appeal.

STANDARD OF REVIEW

Either party to a lawsuit may file a motion for summary judgment, and the court will grant it "if the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law." *FED. R. CIV. P. 56(c)*. "Facts that could alter the outcome are 'material,' and disputes are 'genuine' if evidence exists from which a rational person could conclude that the position of the person with the burden

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[*18] of proof on the disputed issue is correct." *Ideal Dairy Farms, Inc. v. John Labatt, LTD.*, 90 F.3d 737, 743 (3d Cir. 1996) (citation omitted). When a court evaluates a motion for summary judgment, "the evidence of the non-movant is to be believed," *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255, 91 L. Ed. 2d 202, 106 S. Ct. 2505 (1986), and "all justifiable inferences are to be drawn in [the non-movant's] favor." *Id.* Additionally, "summary judgment may not be granted . . . if there is a disagreement over what inferences can be reasonably drawn from the facts even if the facts are undisputed."

Ideal Dairy, 90 F.3d at 744 (citation omitted). However, "an inference based upon a speculation or conjecture does not create a material factual dispute sufficient to defeat entry of summary judgment." *Robertson v. Allied Signal, Inc.*, 914 F.2d 360, 382 n.12 (3d Cir. 1990).

To defeat summary judgment, the non-moving party cannot rest on the pleadings, but rather that party must go beyond the pleadings and present "specific facts showing that there is a genuine issue for trial." *FED. R. CIV. P. 56(e)*

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[*19] . Similarly, the non-moving party cannot rely on unsupported assertions, conclusory allegations, or mere suspicions in attempting to survive a summary judgment motion. *Williams v. Borough of W. Chester*, 891 F.2d 458, 460 (3d Cir.1989) (citing *Celotex v. Catrett*, 477 U.S. 317, 325, 91 L. Ed. 2d 265, 106 S. Ct. 2548 (1986)). Further, the non-moving party has the burden of producing evidence to establish prima facie each element of his claim. *Celotex*, 477 U.S. at 322-23. The non-movant must show more than "the mere existence of a scintilla of evidence" for elements on which he bears the burden of production. *Anderson*, 477 U.S. at 252. Thus, "where the record taken as a whole could not lead a rational trier of fact to find for the non-moving party,

there is no 'genuine issue for trial.'" *Matsushita Elec. Indus. Co., Ltd. v. Zenith Radio Corp.*, 475 U.S. 574, 587, 89 L. Ed. 2d 538, 106 S. Ct. 1348 (1986) (citations omitted).

DISCUSSION

I. Defendants' Motion for Summary Judgment on Plaintiff's Antitrust Claims

A. Violation of the Sherman Act § 1

Defendants argue that plaintiff has failed to provide any evidence

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[*20] in support of its vague allegation that defendants violated § 1 of the Sherman Act, codified at 15 U.S.C. § 1. As the statute and corresponding case law make clear, in order to establish a violation of the *Sherman Act* § 1 plaintiff must prove the existence of a "contract, combination . . . or conspiracy [which results] in restraint of trade or commerce among the several States." 15 U.S.C. § 1; see also, e.g., *Standard Oil Co. v. United States*, 221 U.S. 1, 59, 55 L. Ed. 619, 31 S. Ct. 502 (1911). In response to defendants' argument plaintiff points to (1) letter agreements in which various

companies promised PPL that they would not oppose the position of PPL before the PUC, Pl. Br. 15; Pl. Ex. 6; and (2) an agreement between PPL and "its competitor power suppliers in Pennsylvania in 1998 whereby each of these power suppliers agreed to provide electricity service restricted to their existing retail customers for a period through December 31, 2009 at fixed rates not based on its cost of service." Pl. Br. 14-15; Pl. Ex. 5. In other words, as plaintiff itself clarifies, plaintiff asserts there is sufficient evidence on the record to survive

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[*21] summary judgment on its claim that defendants engaged in illegal price fixing and division of markets. I disagree with plaintiff for the reasons that follow and, accordingly, defendants' motion for summary judgment on plaintiff's claim for violation of the *Sherman Act* § 1 will be granted.

1. Letter Agreements

Plaintiff asserts that defendants "entered into letter agreements supporting long-term fixed POLR rates for each existing retail customer" and such agreements "were never filed with the PUC." Pl. Br. 15. Upon review of the

letter agreements to which plaintiff appears to be referring, Pl. Ex. 6, it is unclear what language in the letters leads plaintiff to its conclusion. The letters do not make any reference to POLR service, nor do they mention "rates" or "customers." Pl. Ex. 6. Rather, the letters evidence agreements between certain companies, including PPL, not to oppose each others' restructuring orders before the PUC. Pl. Ex. 6. In other words, the letters simply memorialize the signatory party's intent to sign the Joint Petition, in exchange for PPL agreeing not to oppose the signatory party's restructuring order before the PUC. Plaintiff fails to explain how the letter

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[*22] agreements evidence either market allocation or price fixing. I address the agreement between PPL and its competitors in the next section.

2. The Agreement

While discussing the "Settlement Agreement" in its memorandum plaintiff fails to make clear that the agreement was actually a "Joint Petition for Full Settlement of PP&L, Inc.'s Restructuring Plan and Related Court Proceedings" which was filed before the Pennsylvania Public Utility Commission ("PUC"). Pl. Ex. 5. As defendants point out, the Joint Petition did not set

any prices, but rather requested the PUC to make changes to PPL rates the Commission had approved in prior restructuring orders. The PUC did, in fact, approve those changes in an order dated August 27, 1998, concluding, "Consistent with the fundamental goals of [the Electric Competition Act, 66 Pa. Cons. Stat. § 2801 *et seq.*], the settlement provides for an orderly transition . . . to a structure under which retail consumers will have direct access to a *competitive market* for the generation of electricity." Def. Ex. U at 7 (emphasis added). In other words, the PUC recognized that the rates contained in the Joint Petition actually

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[*23] *increased* competition.

Plaintiff highlights the fact that PPL sought a 4% reduction in its retail rates for 1999. Pl. Statement of Facts P12. Again, however, plaintiff fails to present the entire picture. First, plaintiff does not mention that PPL sought to increase the retail rates for 2000-2004. Next, and more importantly, although the bundled rate decreased for 1999, the shopping credit, or generation component of the bundled rate, actually increased. In other words, the Joint Petition effectively decreased the portion of the bundled rate attributed to transmission and

distribution charges, which benefits *all* customers, regardless of who supplies the customer's power. Additionally, the Joint Petition increased the chance that customers would be able to effectively "shop" for electricity from alternative suppliers, i.e. find a supplier whose generation rates were better than those of PPL, by increasing the shopping credit or generation rate of PPL. See *Constellation New Energy, Inc. v. Public Service Comm'n of State*, 825 A.2d 872, 882-83 (Del. Super. Ct. 2003). So, the rate changes proposed in the Joint Petition and subsequently approved by the PUC simultaneously

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[*24] decreased transmission and distribution charges for all customers (a market for which there is no competition) and increased the opportunity for customers to save themselves money by finding an alternative supplier. The Joint Petition raised the shopping credits each year from 1999 through 2007 (except for 2005, when the shopping credit proposed in the Joint Petition is marginally higher (\$ 0.0003, or less than 1%)), which makes it easier for the Borough to compete with PPL for the supply of power to retail customers by contracting with other generators of electrical power. How such changes could be considered anticompetitive is not explained by plaintiff.

Defendants argue further that the petition is protected under the *Noerr-Pennington* doctrine, which holds that "[a] party who petitions the government for redress generally is immune from antitrust liability." *Cheminor Drugs, Ltd. v. Ethyl Corp.*, 168 F.3d 119, 122 (3d Cir. 1999), cert. denied, 528 U.S. 871, 145 L. Ed. 2d 146, 120 S. Ct. 173 (1999). More specifically, "parties are immune from liability arising from the antitrust injuries caused by government action which results from the petitioning." *A.D. Bedell Wholesale Co. v. Philip Morris Inc.*, 263 F.3d 239, 251 (3d Cir. 2001).

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[*25] Plaintiff is clearly most concerned with the aspect of the petition that concerns PPL's rates. n10 However, defendants point out that the petition itself did not effectuate any changes to the rates, but rather requested the PUC to make changes to PPL rates. In other words, the act of setting the rates contained in the petition was not completed by the parties to the petition, but rather by the PUC, a government entity. Hence, even if plaintiff could show that the rates requested in the petition and ultimately approved by the PUC had an anticompetitive effect, defendants are immune from antitrust liability under the *Noerr-Pennington* doctrine for any injuries resulting from the PUC setting PPL's rates at those requested in the petition. n11

n10 Plaintiff's allegation of "market allocation" is totally specious. Defendants' agreement to remain "the provider of last resort for all retail electric customers in its service

territory that do not choose or cannot choose to purchase power from alternative suppliers," Pl. Ex. 5 at 15-16, does not restrict competition. Rather, this agreement simply complies with the requirement of *66 Pa. Cons. Stat. § 2807* that "while an electric distribution company collects either a competitive transition charge or an intangible transition charge . . . the electric distribution company shall continue to have the full obligation to serve . . ." *66 Pa. Cons. Stat. § 2807(e)*. Further, the remainder of the section of the Joint Petition concerning PPL's status as a POLR explains the process by which a percentage of PPL's residential customers will be assigned (by the PUC) an alternative POLR in the future. Pl. Ex. 5 at 16-20. Hence, plaintiff provides no support, either in the letters referenced above, Pl. Ex. 6, or in the Joint Petition, Pl. Ex. 5, for its contention that PPL engaged in market allocation.

[*26]

n11 "There is a 'sham' exception to the *Noerr-Pennington* doctrine which holds that using the petitioning process simply as an anticompetitive tool without legitimately seeking a positive outcome to the petitioning destroys immunity. There is no suggestion that the sham exception applies here." *A.D. Bedell*, 263 F.3d at 250 n.29 (internal citation omitted).

Neither the letter agreements nor the Joint Petition raises a genuine issue of material fact concerning whether

defendants engaged in either illegal price fixing or market allocation. Hence, plaintiff has not produced evidence that would allow a reasonable fact finder to conclude that defendants violated the *Sherman Act* § 1. Accordingly, defendants' motion for summary judgment on plaintiff's claims for violation of the *Sherman Act* § 1 will be granted.

B. Violation of the Clayton Act § 2

Section 2 of the *Clayton Act* prohibits "discrimination in price between different purchasers of commodities of like grade and quality . . . where the effect of such discrimination may be substantially to lessen competition

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[*27] or tend to create a monopoly." 15 U.S.C. § 13(a). Defendants argue that plaintiff's claim that PPL violated § 2 of the Clayton Act, 15 U.S.C. § 13, is legally defective, and to the extent that it is not legally defective, plaintiff has failed to produce any evidence in support of its claim. Defendants' argument is complicated by the fact that plaintiff seems to make more than one vague allegation concerning defendants' actions and the *Clayton Act* § 2. First, in its complaint plaintiff alleges that "defendants have maintained discriminatory price differentials between sales to wholesale customers and its

direct sales to large retail customers which have in the past, and continue, to substantially lessen competition in violation of *Section 2 of the Clayton Act*." Compl. P 12. However, in its response to defendants' motion for summary judgment, plaintiff alleges that PPL does not directly sell retail power to the Park customers, but rather PPL sells wholesale power to its own subsidiaries, which then turn around and sell retail power to those customers. These subsidiaries, then, would be in direct competition with the Borough (as they have

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[*28] the exact same relationship with PPL) and any price differentials between what PPL charges its subsidiaries and what it charges the Borough would fit the discrimination provisions of 15 U.S.C. § 13(a). Pl. Br. 19-20. Defendants argue that this new argument is also defective. The two claims will be addressed in turn.

1. Borough Does Not Compete with Industrial Park Retail Customers

Defendants argue that summary judgment should be granted on plaintiff's claim for violation of the *Clayton Act* § 2 (as it is phrased in the complaint) because

plaintiff cannot establish the legal requirements for a price discrimination claim. Defendants point to the Third Circuit's opinion in *Stelwagon Mfg. Co. v. Tarmac Roofing Systems, Inc.*, in which the court explained that in order to prove a price discrimination claim of the type in the instant case, n12 "a plaintiff must first prove that, as the disfavored purchaser, it was engaged in actual competition with the favored purchaser(s) as of the time of the price differential." *Stelwagon Mfg. Co. v. Tarmac Roofing Sys.*, 63 F.3d 1267, 1271 (3d Cir. 1995). Further, even if the favored and the disfavored purchaser were in competition at the

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[*29] time of the price differential, "it must be shown that ... [they] competed at the same functional level, i.e., all wholesalers or all retailers, and within the same geographic market." *Id.* Defendants argue that "the Borough and the Park customers are neither at the same level of distribution nor in competition with each other." Def. Br. 15.

n12 The two most common types of price discrimination claims based on the *Clayton Act* § 2 involve either secondary line injury or primary line injury. "Secondary line injury cases are characterized by price discrimination by a seller in sales to competing buyers." *J.F. Feeser, Inc. v. Serv-A-Portion, Inc.*, 909 F.2d 1524, 1526 (3d Cir. 1990). In other words, secondary line injury results from a seller charging different prices to two purchasers who are in competition with one another. In contrast, primary line injury cases

involve injuries incurred by a direct competitor of the allegedly discriminating seller. See *Brooke Group Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 220, 125 L. Ed. 2d 168, 113 S. Ct. 2578 (1993). The Supreme Court has explained that the essence of a Clayton Act primary line claim is that "[a] business rival has priced its products in an unfair manner with an object to eliminate or retard competition and thereby gain and exercise control over prices in the relevant market." *Id.* at 222. As defendant points out, plaintiff does not make, either in its complaint or in its response to defendants' motion for summary judgment, "any of the allegations necessary to support a primary-line predation case." Def. Br. 15 n. 24. Hence, plaintiff's vague price discrimination claim will be interpreted and treated as a secondary line injury case.

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[*30]

Plaintiff does not directly address this argument, but rather simply points out that in *Hasbrouck v. Texaco, Inc.* the Supreme Court construed § 2 of the *Clayton Act* "as providing a remedy even where the oil company discriminated in price between wholesale buyers and retailers, where the discrimination had a prohibitive effect on competition." Pl. Br. 19 (citing *Hasbrouck*, 496 U.S. 543, 566-67, 110 L. Ed. 2d 492, 110 S. Ct. 2535 (1990)). Plaintiff's reliance on *Hasbrouck* is misguided. First, the Third Circuit decided *Stelwagon* five years after the Supreme Court decided *Hasbrouck*, which makes

Stelwagon the controlling law in the instant case. More importantly, in *Hasbrouck*, Texaco sold gasoline both to retailers directly and to wholesale distributors who in turn sold to retailers, which is the same situation as in the instant case. However, even though the Court ultimately concluded that the price discrimination between the wholesale distributor (i.e. the Borough) and the retail customers (i.e. the Park customers) constituted a violation of the *Clayton Act* § 2, the decision was based on the effect this price discrimination had on competition. More specifically,

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[*31] the court looked at the competition between the wholesale distributors' customers (who were themselves retail customers) and the retail customers who purchased oil directly from Texaco. As the Fifth Circuit has astutely summarized, "The Supreme Court focused on whether the price discrimination caused injury to competition regardless of whether the favored purchaser was a direct competitor at the same functional level as the disadvantaged purchaser." *Lycon, Inc. v. Juenke*, 250 F.3d 285, 289 (5th Cir. 2001). In the instant case, as in *Lycon*, the alleged price discrimination n13 was between a wholesale purchaser and reseller (the Borough) and

retail end users (Park customers), as opposed to two customers who ultimately resold the product (whether at wholesale or retail), as in *Hasbrouck*. Since the Park customers never resold the energy they received from PPL, they were never in competition with the Borough. Hence, competition could not have been harmed by the alleged price discrimination. Further, the Borough and the Park customers do not exist at the same functional level, as required by the Third Circuit in *Stelwagon*. See *Stelwagon*, 63 F.3d at 1271.

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[*32] Accordingly, on the undisputed facts this version of plaintiff's *Clayton Act* § 2 claim must fail and defendant's motion for summary judgment on this particular claim will be granted.

n13 Plaintiff has not produced the one piece of evidence upon which its entire claim rests-the prices charged to the Borough and the Park customers, respectively. Again, however, for the sake of efficiency I focus on the legal arguments put forth rather than on any factual deficiencies.

2. Intra-Corporate Transfers Cannot Form the Basis of a § 2 Claim

In its response in opposition to defendants' second motion for summary judgment plaintiff argues that "the Borough itself is indistinguishable from those subsidiaries of PPL which are distributing electric power to retail customers in the Borough for whom the Borough is competing to serve." Pl. Br. 19. In other words, the Borough attempts to cure the defect in its original *Clayton Act* § 2 claim, i.e. that it does not compete with the allegedly favored purchasers, by arguing that

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[*33] the "favored purchasers" are not the Park retail customers, but rather the PPL subsidiaries which actually sell the retail electricity to the Park customers. However, even if plaintiff could show that PPL charged its subsidiaries and the Borough different prices for the same energy (and, again, plaintiff has provided no evidence to support this contention), "the federal courts of appeals have unanimously adopted a per se rule that 'intra-corporate transfers'-i.e., a parent corporation's transfer of goods to its wholly-owned subsidiary-cannot form the basis of a [Clayton Act § 2] claim." *Accurate Control Sys. v. Neopost, Inc.*, 2002 U.S. Dist. LEXIS

11340, 2002 WL 1379132, at *1 (N.D. Ill. 2002) (citing cases from the First, Fifth, Sixth, Seventh and Eighth Circuits). The reasoning behind these decisions, although not binding, is convincing. As then-Judge (now Justice) Breyer concluded in *Caribe BMW, Inc. v. BMW*, based in significant part on the Supreme Court's decision in *Copperweld Corp. v. Independence Tube Corp.*, 467 U.S. 752, 81 L. Ed. 2d 628, 104 S. Ct. 2731 (1984), a firm and its wholly-owned subsidiary are a single entity for purposes of price discrimination analysis, thereby eliminating

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[*34] the potential for a *Clayton Act* § 2 "sale" that could reflect a price discrimination. *Caribe BMW v. Bayerische Motoren Werke Aktiengesellschaft*, 19 F.3d 745, 749-51 (1st Cir. 1994) (relying on the Supreme Court's reasoning in *Copperweld Corp. v. Independence Tube Corp.*, 467 U.S. 752, 81 L. Ed. 2d 628, 104 S. Ct. 2731 (1984)).

Since the wholly-owned subsidiary (here PPL Electric Utilities, Inc., formerly PP&L, Inc.) does not qualify as a purchaser of the parent company's product (PPL's electricity), there needs to be another purchaser who competes for resale with the Borough. As discussed above, no such competitor exists because the purchasers involved here are the Park customers who do not resell

the electricity purchased from PPL. And as concluded above, since there was no competition between the Park customers and the Borough, competition could not have been harmed by the price discrimination and summary judgment on this version of plaintiff's *Clayton Act* § 2 is appropriate and will be granted.

C. Violation of the Sherman Act § 2

Defendants argue that plaintiff has failed to provide any evidence in support of its allegation that defendants violated § 2 of the *Sherman Act*, which prohibits monopolization

[*35] or attempted monopolization of a trade, either single-handedly or via a combination or conspiracy. 15 U.S.C. § 2. Plaintiff appears to make two separate claims. First, plaintiff specifically alleges that defendants created a "price squeeze" by requiring plaintiff "to pay wholesale prices for electric power substantially higher than the retail prices the Defendants charge for comparable service to its commercial and industrial customers, based on the additional charge demanded of Plaintiff by Defendants." Compl. P 17. Plaintiff also seems to make the more general claim that defendants have monopolized or attempted to monopolize the wholesale power market. Compl. PP 12, 22(b), 22(c). For the reasons that follow, I

will grant defendants' motion for summary judgment on plaintiff's price squeeze claim with prejudice. However, I will grant defendants' motion for summary judgment on plaintiff's more general *Sherman Act* § 2 claim without prejudice to plaintiff's right to pursue the claim in the *Lansdale* action.

1. Price Squeeze

It is generally accepted that a "price squeeze involves a defendant who as a monopolist supplies the plaintiff at one level (e.g., wholesale),

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[*36] competes at another (e.g., retail), and seeks to destroy the plaintiff by holding up the wholesale price to the plaintiff while depressing the retail price to common customers." *Utilimax.com, Inc. v. PPL Energy Plus, LLC*, 273 F. Supp. 2d 573, 582 (E.D. Pa. 2003) (quoting *Town of Norwood v. New England Power Co.*, 202 F.3d 408, 418 (1st Cir. 2000)); see also *Ellwood City, Grove City, New Wilmington, etc. v. Federal Energy Regulatory Com.*, 701 F.2d 266, 268 n.4 (3d Cir. 1983) ("Price squeeze' is defined as a situation in which a wholesale supplier also selling at the retail level charges discriminatorily high rates to a wholesale customer to

prevent competition by that customer at retail."). Implied in this definition is an intent requirement, which the Third Circuit has, in fact, explicitly required. The court explained in *Bonjorno v. Kaiser Aluminum & Chem. Corp.*, that "the plaintiff must present evidence that the defendants deliberately produced the effect, sufficient to provide a reasonable basis for the jury to conclude that the 'squeeze' was not the result of natural market forces such as supply and demand or legitimate competition." *Bonjorno v. Kaiser Aluminum & Chemical Corp.*, 752 F.2d 802, 809 (3d Cir. 1984).

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[*37]

So, for plaintiff to prevail on its price squeeze claim it must prove: (1) it could not profitably compete with PPL for Park customers because the difference between PPL's retail rate charged to the Park customers and its wholesale rate charged to the Borough was too small or non-existent (i.e. that there was, in fact, a price squeeze); (2) PPL had monopoly power at the wholesale level; and (3) PPL intended to create a price squeeze to eliminate the Borough as a competitor at the retail level. Defendants claim that plaintiff has not produced sufficient evidence on *any* of these factors to survive

summary judgment. Obviously, failure to produce sufficient evidence to allow a reasonable jury to find in plaintiff's favor on any one facet of this § 2 *Sherman Act* claim is fatal to the entire claim. Because plaintiff neither disputes defendants' evidence regarding the prices actually charged to both the Park customers (retail) and the Borough (wholesale), Def. Ex. D at PP 13-16, nor offers evidence that would otherwise contradict that evidence, and defendants' evidence shows that there was, in fact, no price squeeze, defendants' motion for summary judgment on this claim will be granted.

[*38]

Defendants have submitted the affidavit of Oliver G. Kasper, the manager of pricing and contract information at PPL, in support of their position that a price squeeze did not, in fact, exist. Def. Ex. D at PP 13-16. Kasper summarized the charges incurred by retail Park customers for the period of February 1999 through October 2002 and compared them to the Borough's bills for wholesale power. *Id.* Exclusive of stranded costs, the Park customer that paid the lowest price per kilowatt hour still paid more than what the Borough paid per kilowatt hour for the same energy. *Id.* Although the Park customer would still

have to pay the retail stranded costs to PPL even if it buys its power from the Borough (a point in contention that will be discussed in Part II.A of this opinion), there is no allegation or evidence that the stranded cost charge would change. Since the retail stranded cost charge the Park customers would be required to pay is the same regardless of the final energy provider (i.e. PPL or the Borough), it drops out of the equation. The only charge that matters is the charge for the actual energy received. Hence, if the wholesale rate charged to the Borough is less than

[*39] the retail rate that would otherwise be charged to the Park customers, there is arguably room for the Borough to turn around and resell the electricity at a profit. This effectively disproves the Borough's price squeeze claim.

The Borough does not directly address this argument. Rather, plaintiff reiterates its claims without citing supporting evidence. Simply using the phrase "the evidence clearly demonstrates . . ." does not cure this defect. Pl. Br. 11. Although not controlling in this case, the elements of the prima facie case of a price squeeze

n14 required for the FERC to consider such a claim in a rate proceeding are instructive. *See 18 C.F.R. § 2.17*. The wholesale customer alleging a price squeeze must present, *inter alia*, "[a] showing that the retail rates are lower than the proposed wholesale rates for comparable service; and the wholesale customer's prospective rate for comparable retail service, i.e. the rate necessary to recover bulk power costs (at the proposed wholesale rate) and distribution costs." *18 C.F.R. § 2.17*. The Borough presents none of this information, neither directly nor through its experts' affidavit

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[*40] opinions. Although plaintiff has filed many papers in opposition to defendants' two motions for summary judgment and has provided a number of documents in support of its position, it does not provide either PPL's retail rates to the Park customers or PPL's wholesale rates to the Borough. Obviously, then, the Borough cannot (and does not) compare the two prices to show that it is impossible for the Borough to resell the electricity to the Park customers for a profit.

n14 The regulation uses the phrase "price discrimination and anticompetitive effect" as a

synonym of "price squeeze." 18 C.F.R. § 2.17.

Plaintiff also relies on the reports of its experts, Whitfield Russell, Pl. Ex. 1, and Dr. John Wilson, Pl. Ex. 3, which allegedly set forth "the detailed substantial evidence supporting these price squeeze claims." Pl. Br. 9. These expert opinions, however, are insufficient to survive defendants' motion for summary judgment. First, Dr. Wilson's opinion "addresses the price-squeeze allegation

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[*41] in a single, conclusory paragraph that contains neither any price information nor any references to supportive data or evidence." Def. Resp. 7 (citing Pl. Ex. 3 at P 31). In fact, Dr. Wilson does not cite a single piece of evidence that would support his conclusions, nor does plaintiff. As the Third Circuit has previously held, "The factual predicate of an expert's opinion must find some support in the record." *Pennsylvania Dental Ass'n v. Medical Service Ass'n of Pennsylvania*, 745 F.2d 248, 262 (3d Cir. 1984) (citing with approval *Merit Motors, Inc. v. Chrysler Corp.*, 187 U.S. App. D.C. 11, 569 F.2d

666 (D.C. Cir. 1977)). The court in *Merit* made clear that to hold a court is precluded "from granting summary judgment against a party who relies solely on an expert's opinion that has no more basis in or out of the record than . . . theoretical speculations would seriously undermine the policies of *Rule 56*." *Merit*, 569 F.2d at 673. As the court concluded in *Pennsylvania Dental*, the Wilson "affidavit [does] not raise an issue of material fact," *Pennsylvania Dental*, 745 F.2d at 262, and therefore does not support

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[*42] plaintiff's opposition to defendants' motion for summary judgment on plaintiff's claim for an illegal price squeeze.

The report of plaintiff's other expert, Whitfield Russell, does not support plaintiff's position, either. First, although Russell concludes that "PPL engaged in activities that drove up the price of wholesale power" and "PPL has designed [retail] rates to enable it to retain retail loads to the detriment of competition and Olyphant," Pl. Ex. 1 at 4-5, he does not explicitly state that PPL's wholesale and retail pricing schemes created a price squeeze. Rather, Russell explains that PPL's actions "may

either (a) create a price squeeze between the cost of wholesale and retail power *at the time in which the current contract with Olyphant expires* or (b) create barriers to competition that will increase the price of wholesale power above competitive price levels." *Id.* at 5 (emphases added). In other words, PPL's alleged anticompetitive actions *may* create a price squeeze *in the future*. Russell does not say, nor support with evidence, that PPL's actions had the effect of creating a price squeeze in the past. In fact, Russell focuses on the amount of money

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[*43] the Borough could have saved had the wholesale prices been different. Russell does not mention (or attach) wholesale and retail prices specifically n15 nor vaguely opine that the Borough could not in the past profitably purchase energy from PPL at wholesale and resell that energy to Park customers at retail. Russell does not set forth "the detailed substantial evidence supporting these price squeeze claims." Pl. Br. 9. As with Dr. Wilson's affidavit, the Russell "affidavit [does] not raise an issue of material fact," *Pennsylvania Dental*, 745 F.2d at 262, and therefore does not support plaintiff's opposition to defendants' motion for summary judgment on plaintiff's claim for an illegal price squeeze.

n15 At oral argument, I granted plaintiff permission to provide the power prices for the Borough and the Park customers, respectively, which were contained in a spreadsheet accidentally omitted from Russell's report. The spreadsheet provided in the Borough's April 14,

2004 letter does not appear to be the same spreadsheet as the one purportedly inadvertently omitted in the first place, and hence violates this court's prohibition of adding documents to the current record. For the sake of efficiency, however, I will consider it. As defendants point out in their reply letter of April 20, 2004, the rates listed in the spreadsheet actually confirm PPL's position that the rates paid by the Borough were substantially less than those paid by the Park customers who received 12 kV power. *See* pages 5 and 6 of spreadsheets attached to plaintiff's April 14, 2004 letter. The largest Park customer, WEA Manufacturing, Inc., received lower rates, but since it received 69 kV power and not 12 kV power like every other customer, including the Borough, these price differences are not comparable.

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[*44]

Further, the Borough has failed to produce any evidence that PPL in fact had a monopoly on wholesale power. In fact, at the status conference, plaintiff conceded that there are seven to eight alternative wholesale suppliers from whom the Borough could purchase power. Since the Borough could arguably go elsewhere to purchase wholesale power, or, at least, has failed to produce evidence that it is unable to purchase wholesale power from alternative suppliers, plaintiff's price squeeze claim must fail as a matter of law.

In sum, plaintiff has failed to show that there is a genuine issue of material fact that precludes summary

judgment on its price squeeze claim. More specifically, plaintiff has not shown more than "the mere existence of a scintilla of evidence," *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 252, 91 L. Ed. 2d 202, 106 S. Ct. 2505 (1986), such that a reasonable fact finder could conclude defendants created a price squeeze in violation of the *Sherman Act* § 2. Accordingly, defendants' motion for summary judgment on plaintiff's price squeeze claim will be granted.

2. Monopolization of Wholesale Power Market

Defendants did not initially address this claim in their motion

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[*45] for summary judgment, perhaps because plaintiff's claim is so vaguely stated in its complaint. However, in plaintiff's response in opposition to defendants' motion for summary judgment, the Borough spends a considerable amount of time defending its *Sherman Act* § 2 claim by arguing that "PPL used its monopoly power in the market for firm capacity n16 of electric power to drive up the prices for such capacity, which resulted in substantial increases in the available price of firm electricity available in Pennsylvania." Pl. Br. 4. Plaintiff argues further that PPL's actions in this regard "resulted in no competitive power suppliers being available" to the

Borough. Pl. Br. 6. Defendants argue in their reply to plaintiff's response that "the Borough's claim that PPL's activities in the PJM daily capacity auction could amount to a *Sherman Act* § 2 violation" is "devoid of factual support." Def. Resp. 10. Because this claim is reiterated in *Borough of Lansdale v. PP&L, Inc.*, No. 02-8012 (E.D. Pa. filed Oct. 22, 2002), in which plaintiff is a party, and there has been a development in the law since the papers concerning defendants' motion for summary judgment were filed, I will grant

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[*46] defendants' motion on this claim without prejudice to the right of the Borough to pursue this claim in the *Lansdale* action.

n16 "Firm capacity" is "the ability to generate electric energy when called upon to do so." *Utilimax.com v. PPL*, 273 F. Supp. 2d 573, 576 (2003). For a more complete explanation of the firm capacity market and how it works, see *Utilimax.com*, 273 F. Supp. 2d at 576-77.

On July 18, 2003, the Honorable Anita B. Brody of this court issued an opinion in *Utilimax.com, Inc. v. PPL*, holding that plaintiff's claim (plaintiff was a wholesale customer) that PPL controlled the price of firm capacity in 2001 and thereby violated the antitrust laws was barred by the filed rate doctrine. *Utilimax.com*, 273 F. Supp. 2d 573 (E.D. Pa. 2003). That decision has been appealed. At a status conference before this court on November 7, 2003, defendants stated that they did not think the Third Circuit's decision on the *Utilimax.com* appeal would impact

[*47] the instant case and, thus, it was not necessary to stay the case until the Third Circuit issued its opinion. Upon further review, however, it appears that plaintiff's claim that defendants monopolized or attempted to monopolize the wholesale power market is dependent in significant part on PPL's actions in the ICAP market for firm capacity, which was considered and ruled upon in *Utilimax.com*. More specifically, plaintiff's claim seems to be that "it was forced to pay excessive rates when it purchased capacity in a market regulated by rates set by FERC," *Utilimax.com*, 273 F. Supp. 2d at 585, a claim

which the *Utilimax.com* court ruled is barred by the filed rate doctrine. *Id.* at 587. To the extent that plaintiff's claim is that PPL's actions in the firm capacity market, though not anticompetitive themselves, eliminated alternative wholesale power suppliers, plaintiff has not explained how this could happen. Additionally, at the status conference, plaintiff conceded that there are seven to eight alternative wholesale suppliers from whom the Borough could purchase power, though presently at an increased cost. Given the apparent significance of

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[*48] the *Utilimax.com* decision on plaintiff's general *Sherman Act* § 2 claim, and the fact that neither party has addressed the decision in detail, it is appropriate to grant defendants' motion, but without prejudice to the right of plaintiff to pursue this claim in the *Lansdale* action, which would allow the plaintiffs and the court to have the benefit of the Third Circuit's views in *Utilimax.com*.

II. Defendants' Motion for Summary Judgment on Plaintiff's Claim for Breach of Contract and/or Violation of Final Orders of FERC

In its complaint plaintiff alleges that defendants have

breached the FERC settlement agreement dated January 29, 1998 and the five-year power supply agreement between the Borough and PPL dated December 8, 1998. Compl. P 19-21. Hence, count II of the complaint appears to assert a claim for breach of contract. However, in response to defendants' first motion for summary judgment, plaintiff argues that the claim contained in count II of the complaint is not simply for breach of contract, but rather is a claim under *section 317 of the Federal Power Act* n17 seeking to enforce the FERC's orders approving the agreements. Although the parties dispute the

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[*49] correct characterization of this claim, I do not address this issue. Rather, since the claim is reiterated in *Borough of Lansdale v. PP&L, Inc.*, No. 02-8012 (E.D. Pa. filed Oct. 22, 2002), for the sake of judicial efficiency I focus on the agreements to determine whether there is evidence that they were, in fact, breached by defendants. Plaintiff's specific claims are that defendants breached the contract by (1) informing the Borough that it or its customers would be required to pay a retail stranded cost charge for the Park customers if it became the retail power supplier for those customers, and (2) contending that the firm power supply defendants now deliver to the Borough could be of a lower quality than that which defendants presently provide directly to their own Park customers. Compl. P 20-21. For the reasons that follow, I will grant defendants' motion for summary judgment on plaintiff's claims for breach of the FERC settlement

agreement and the parties' power supply agreement.

n17 Section 317 of the Federal Power Act reads in pertinent part, "The District Courts of the United States . . . shall have exclusive jurisdiction of . . . of all suits in equity and actions at law brought to enforce any liability or duty created by, or to enjoin any violation of, [the FPA] or any rule, regulation, or order thereunder." 16 U.S.C.A. § 825p. Plaintiff has submitted no authority supporting its argument that a breach of the FERC settlement agreement would be a breach of the FERC order approving the settlement agreement reached by the parties.

[*50]

A. Retail Stranded Costs

Plaintiff's first claim stems from a clause in the FERC settlement agreement that reads, "PP&L will not seek any stranded cost recovery or exit fee against any of the Parties to this Settlement Agreement, and hereby waives any present or future rights to any such claims." Settlement Agreement § 2.6 (alternatively phrased at § 6.2). The agreement does not otherwise mention stranded costs and the parties' power supply agreement does not discuss stranded costs at all. In the complaint, plaintiff claims that PPL would require the Borough to pay retail

stranded costs for the Park customers if it became the energy supplier for any of the those customers. The Borough contends this would clearly violate the settlement agreement. However, the Borough has not produced any evidence in support of this allegation. In contrast, the proposed letter from PPL to Park customers, Pl. Ex. 1 at PPL Doc. 0066915-16, clearly explains that the customers themselves, as opposed to the Borough, would be required to continue paying the retail stranded cost charges currently incurred. *Id.* In opposition to defendants' motion for summary judgment, plaintiff expands its allegation

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[*51] to include the claim that requiring Park customers to continue paying retail stranded costs even after the Borough becomes the energy supplier would similarly violate the agreement. This issue was the topic of PPL's petition to the FERC for a declaratory order. Although not binding on this court, the FERC's reasoning in this instance is convincing.

The FERC primarily looked at the plain language of the agreement, focusing on the phrase "Parties to this Agreement." The FERC noted that "the parties to the Settlement Agreement were PPL's *wholesale*

requirements customers (who initiated the proceeding in which the Settlement Agreement was approved to pursue their rights to *wholesale* services)." 75 F.E.R.C. 61,370 at P 14. Based on this fact, the FERC concluded that the agreement did "not address-and thus would not limit or preclude-PPL's ability to recover *retail* stranded costs from its existing *retail* customers." *Id.* In other words, the FERC came to the logical conclusion that since no retail customer of PPL was a party to the settlement agreement, the agreement does not bind PPL in any way with respect to PPL's ability to recover retail stranded costs

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[*52] from its retail customers. n18 Plaintiff has failed to produce an argument that could convince this court or any reasonable fact finder otherwise. The FERC settlement agreement clearly and unambiguously refers only to wholesale stranded costs and not to retail stranded costs.

n18 The FERC has explained the difference between "wholesale stranded cost" and "retail stranded cost" in the following manner:

As the definitions of those terms makes clear, it is not the nature of the costs (wholesale vs. retail) that is controlling for purposes of stranded cost recovery under [Order No. 888]. Rather, the controlling factors are the status of the customer (wholesale transmission services customer vs.

retail transmission services customer) with whom the costs are associated, and whether the transmission tariffs used by the customer to escape its former power supplier (thus causing the stranded costs to occur) were required by [the FERC] or by a state commission. As a result, "retail stranded costs" refers to stranded costs associated with retail wheeling customers.

Since Park customers that would purchase energy from the Borough, as opposed to from PPL directly, would be retail wheeling customers, any stranded costs sought to be collected from Park customers would be considered retail stranded costs.

[*53]

PPL's ability to recover retail stranded costs from Park customers who seek to receive service from the Borough will be governed, instead, by the PUC's ruling on this issue. Def. Ex. U. Since neither party has asserted a claim based on this final order, I need not address the specifics of it. n19 The unambiguous FERC settlement agreement does not restrict PPL's ability to recover retail stranded costs from Park customers who seek service from the Borough, and so defendants' position that they are entitled to such costs could not constitute a breach of that agreement. No reasonable fact finder could conclude otherwise. Accordingly, defendants' motion for summary judgment on plaintiff's claim that defendant breached the settlement agreement by seeking retail stranded costs from Park customers who might purchase energy from the Borough will be granted.

n19 The FERC's interpretation of the PUC

order and the FERC settlement agreement, however, perfectly captures my sentiment: "Olyphant's strained interpretation of the Settlement Agreement would effectively nullify [the PUC] order in a way not contemplated by the Settlement Agreement and not contemplated by [the FERC's] policies regarding the recovery of stranded costs under Order No. 888." 75 F.E.R.C. 61,370 at P 15. Of course, plaintiff does not mention the Joint Petition and corresponding PUC order when discussing this issue, which specifically address retail stranded costs, even though it relies so heavily on the Joint Petition for other claims. *See* Part I.A.2; Pl. Ex. 5 at 9-12. Further, the PUC issued an order on December 18, 2003, in which it agreed with the defendants' position on retail stranded costs. That decision, however, is currently on appeal.

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[*54]

B. Firm Power Supply

Plaintiff alleges that defendants have breached the contractual requirement (found in both the FERC settlement agreement and the parties' power supply agreement) that PPL provide the Borough with its "firm power requirements" by contending that the firm power supply that Defendants deliver to the Plaintiff for service to its customers located within the Borough can be of lower quality than that which Defendants would provide to the retail customers Defendants seek to directly serve." Compl. P 21. Plaintiff claims in its opposition to

defendants' motion for summary judgment that PPL has somehow converted the Borough's firm-power service into an interruptible service. Pl. Br. 25. As defendants explain, "Firm power is power that is 'intended to be available at all times during the period covered by a commitment, even under adverse conditions.'" Def. Br. 23 (quoting Edison Electric Institute, GLOSSARY OF ELECTRIC UTILITY TERMS 50 (1995)); *see also Borough of Lansdale v. Philadelphia Electric Co.*, 692 F.2d 307, 310 n.3 (3d Cir. 1982) (defining "firm electric power" as "power which the consumer is assured will be available on demand").

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[*55] Plaintiff does not object to this definition nor provide any conflicting definition of "firm power." As defendants point out, the parties' power supply agreement delineates PPL's obligation to provide continuous, uninterrupted service to the Borough: "PP&L shall use reasonable diligence to maintain uninterrupted supply of electric power and energy to Olyphant." Power Supply Agreement P 10. Plaintiff does not allege, nor produce evidence in support of an allegation, that defendants have ever interrupted service in breach of this agreement. n20 In fact, defendants highlight testimony from a number of Borough officials who have maintained that PPL's service to the Borough has been "extremely reliable." Def. Br. 22. Plaintiff has not produced any evidence that PPL has ever interrupted the Borough's service and thereby breached PPL's obligation under the agreements to provide the Borough's firm power requirements.

n20 Plaintiff attached a January 8, 2003 affidavit from Whitfield Russell to its post-oral argument April 14, 2004 letter, to which Russell attached a list of outages in the Borough from February 1999 through November 2002. All of these outages, however, occurred for reasons beyond the control of PPL. For example, outages occurred due to lightning strikes, a vehicle accident, an instance where a squirrel interfered with the lines, and attempts by PPL to make changes to the lines. These types of outages are not those considered to be "interruptions" by PPL, and hence they do not serve as evidence that PPL has ever interrupted the Borough's service in breach of the "firm power" requirement in the contract.

[*56]

Plaintiff appears to make the claim that even if its power has not yet been interrupted, the fact that PPL has only a single line transmitting the firm power requirements to the Borough renders PPL's "firm power" service unsatisfactory and inferior to PPL's firm power service to its retail customers. Pl. Br. 24-25. Plaintiff then uses this argument to support its contention that PPL must build a second line to provide service to the Borough. Pl. Br. 25. However, plaintiff does not point to any terms in the contract that would require such an addition by PPL at PPL's expense. Rather, plaintiff relies

on its "inferior firm power" argument. n21 Again, though, plaintiff has not produced any evidence that its firm power service is inferior to that of PPL's retail customers. A reasonable fact finder could neither conclude that PPL failed to provide the Borough's firm power requirements in violation of the agreements, nor find that PPL will likely fail to provide the Borough's firm power requirements in the future because of an inferior distribution system. Accordingly, defendants' motion for summary judgment on plaintiff's claim of breach of contract and/or final orders of FERC will be

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[*57] granted.

n21 At oral argument, plaintiff contended that there are a number of cases where the FERC found two-line service is necessary to meet the "firm power" requirement, and that, therefore, one-line service, as the Borough currently has, does not meet the firm power requirement. I gave plaintiff the opportunity to provide copies of these cases in support of this argument. Plaintiff, however, has failed to do so. Instead, plaintiff submits an article by Whitfield Russell, which does not compare the ability of one-line and two-line systems to provide "firm power," but

rather discusses the declining standards of "reliability" in the national electric power market generally. This article is irrelevant and will be disregarded.

CONCLUSION

Defendants' motion for summary judgment will be granted. Although plaintiff has filed a number of documents in opposition to defendants' motion for summary judgment, it appears that rather than making a reasonable attempt to demonstrate a genuine issue of material fact,

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[*58] plaintiff has instead relied on conclusory allegations. Plaintiff fails to produce even an iota of evidence in support of most of its claims and much of the evidence actually cited by plaintiff does not support the contentions plaintiff purports it supports. For these reasons, defendants' motion for summary judgment will be granted on plaintiff's claims for violation of the *Sherman Act* § 1, the *Sherman Act* § 2 via a price squeeze, and the *Clayton Act* § 2, as well as plaintiff's claim for breach of contract and/or violation of final orders of the FERC. However, because there has been a development in the law since the papers concerning defendants' motion for summary judgment were filed, I

will grant defendants' motion on plaintiff's claim that defendants monopolized or attempted to monopolize the wholesale power market in violation of the *Sherman Act* § 2 without prejudice. An appropriate order follows.

ORDER

And now, this 14th day of May, 2004, upon consideration of the motions for summary judgment of defendants PP&L, Inc., PPL Corporation, PPL Electric Utilities Corporation and PPL Generation, L.L.C., the accompanying memoranda of law, and statements of facts,

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[*59] the responses in opposition thereto of the Borough of Olyphant, Pennsylvania, plaintiffs' accompanying statements of facts, and defendants' reply memoranda in further support of their motions for summary judgment and after oral argument on April 8, 2004, it is hereby ORDERED that the defendants' motion is GRANTED. Judgment is ENTERED in favor of PP&L, Inc., PPL Corporation, PPL Electric Utilities Corporation and PPL Generation, L.L.C. and against the Borough of Olyphant on plaintiffs' claims for violation of the *Sherman Act* § 1, the *Sherman Act* § 2 via a price squeeze, and the *Clayton Act* § 2, as well as plaintiff's claim for breach of contract

and/or violation of final orders of the FERC. Defendants' motion for summary judgment is also GRANTED on plaintiff's claim that defendants monopolized or attempted to monopolize the wholesale power market in violation of the *Sherman Act* § 2, but without prejudice to the right of plaintiff to pursue the claim in *Borough of Lansdale v. PPL*, No. 02-8012 (E.D. Pa. filed Oct. 22, 2002).

The court will arrange a telephone conference concerning defendants' .

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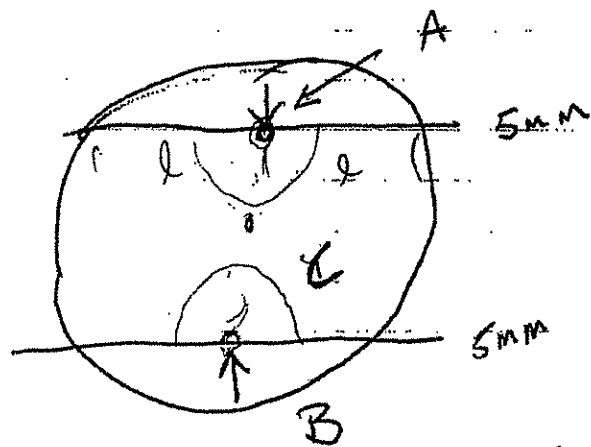
[*60] counterclaims for June 1, 2004, at 4 p.m.

William H. Yohn, Jr., Judge

EXHIBIT 20

**THIS EXHIBIT HAS BEEN
REDACTED IN ITS ENTIRETY**

EXHIBIT 21



5mm
Testing

Ex 4

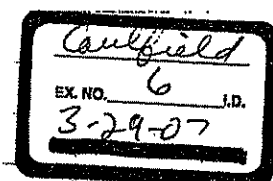
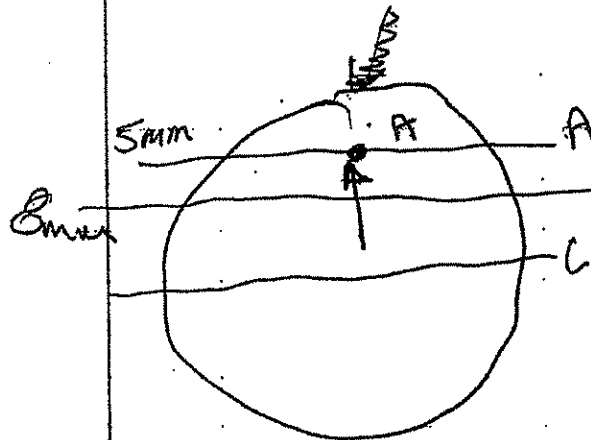


EXHIBIT 22



Ex 5
Protocol &
Report

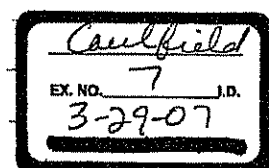


EXHIBIT 23

**THIS EXHIBIT HAS BEEN
REDACTED IN ITS ENTIRETY**